First Annual Report 1985 Queensland Electricity Commission

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Queensland Electricity Commission First Annual Report 1985

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Abbreviations used in this Report

Abbreviations used in this Report and their meanings are:

kV	kilovolt One kV = 1 000 volts. A volt is the unit of potential or electrical pressure.
MW	megawatt One MW = 1 000 kilowatts or one million watts. A watt is the unit of power or the rate of doing work.
kWh	kilowatt hour The standard unit of energy which represents the consumption of electrical energy at the rate of one kilowatt over a period of one hour. It is commonly known as the "unit".
MWh	megawatt hour One MWh = 1 000 kilowatt hours.
GWh	gigawatt hour One GWh = 1 000 megawatt hours or one million kilowatt hours.
MVA	megavolt ampere A unit representing the rating of a transformer.
MVAr	megavolt ampere (reactive) A unit representing the rating of a capacitor or reactor.
SWER	single wire earth return A type of transmission line construction which uses the earth rather than a wire cable to complete the electrical circuit.
km	kilometre
M	million
m	metre
ha	hectares

NEIL ARTHUR GALWEY,
B.E., F.I.E. Aust., A.A.U.Q. (Prov.), F.A.I.M.,
Electricity Commissioner; formerly State Electricity Commissioner from July 1980; born and educated in Brisbane; graduate of the University of Queensland.

Mr Galwey joined the former State Electricity Commission of Queensland in 1977 as Deputy State Electricity Commissioner (Engineering). Before then he had served with the former Southern Electric Authority of Queensland since 1954, his last appointment being Chief Engineer Distribution.

He is Deputy Chairman of the Queensland Energy Advisory Council, a member of the Australian National Committee of the World Energy Conference and Vice President of the Electricity Supply Association of Australia.

As Electricity Commissioner, Mr Galwey is Chief Executive of the Queensland Electricity Commission and administers the application of the Electricity Act. He has assumed personal responsibility for corporate planning and, through a small staff unit, for public relations.

QEC

Queensland Electricity Commission

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1 July 1985

Sir,

Under section 434 of the Electricity Act 1976-1985, it is my honour to present to you for submission to Parliament the first Annual Report of The Queensland Electricity Commission. The Financial Report, also required under section 434, will be available for tabling later in the year.

The final report of The Queensland Electricity Generating Board and the annual reports of each Electricity Board, The Queensland Electricity Supply Industry Superannuation Board and The Electrical Workers and Contractors Board are still to be submitted to the Commission in accordance with the Act. This cannot be done until audited accounts are available.

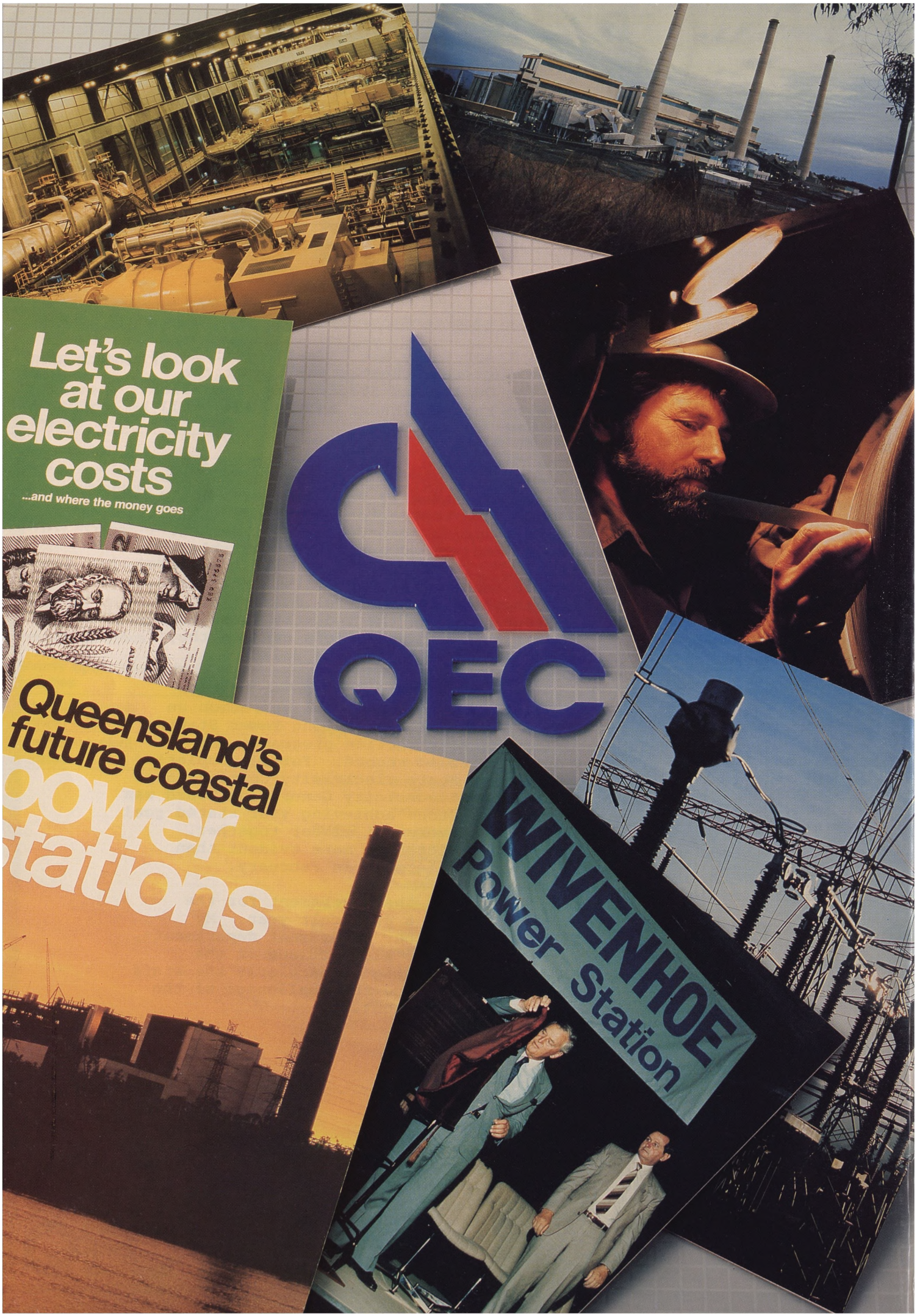
This year has been one of considerable activity - the year brought achievements, changes and industrial disruption. While the industrial troubles which the industry faced may have been the more significant because of the changes they caused, they did nothing to detract from the solid achievements the electricity supply industry recorded. The completion and official opening of Wivenhoe Power Station last October and the acceptance in commercial operation on 1 May 1985 of the second 350 MW unit at Tarong Power Station according to the accelerated construction programme are indicative of the industry's solid record. Formal completion of amalgamation of the former State Electricity Commission of Queensland and The Queensland Electricity Generating Board was an especially significant milestone achieving your stated goal of bringing the industry and Government closer together. Nowhere was the value of this closeness more evident than during the period of industrial turmoil in February.

I express my gratitude to you and the Government for the guidance and support given during a difficult year. My appreciation also is offered to other Government departments, local and statutory authorities and all sections of the electricity supply industry, including particularly the staff of the Commission which will now face the challenges of the future as a cohesive and effective unit.

N. Galwey.

N.A. Galwey
ELECTRICITY COMMISSIONER

The Honourable Ivan J. Gibbs, M.L.A.,
Minister for Mines and Energy,
BRISBANE Q 4000


Let's look at our electricity costs
...and where the money goes
QEC
Queensland's future coastal power stations
WIVENHOE
Power Station

Highlights of 1984 / 85

- Formal amalgamation of the former State Electricity Commission of Queensland and the Queensland Electricity Generating Board was attained. The merger first was announced in April 1982 and was concluded when the Queensland Electricity Commission became operational on 1 January 1985.
- Electricity tariff equalisation — effective for the whole of 1985/86 — was achieved for domestic and most other consumers in Queensland.
- The State Government approved acquisition of four sites for proposed coastal power stations, to be used over the next 40 or so years. It also approved investigation of possible future sites in inland areas (including parts of the Darling Downs).
- Maximum demand on the Statewide generation and transmission system — 3 308 MW on 3 July 1984 — lifted the previous peak by 14.8 per cent and was followed on 25 June 1985 by a new morning consumption peak of 3 038 MW, 72 MW greater than the previous mark.
- Total energy sales from the Statewide grid were 16 377 GWh, 7.8 per cent higher than in 1983/84.
- The industry suffered its worst period of industrial turmoil in the February dispute touched off by Electrical Trades Union members' objections to The South East Queensland Electricity Board's use of private contractors to carry out certain capital development works. However, this resulted in significant new industrial initiatives by the State Government designed to prevent future strikes in this essential industry.
- Staff numbers declined by 1.1 per cent during the year.
- The official opening of Wivenhoe Pumped Storage Hydro-electric Power Station was performed on 5 October by the Premier of Queensland and State Treasurer, the Honourable Sir Joh. Bjelke-Petersen, K.C.M.G., M.L.A.
- Major reinforcements of the 275 kV system to North Queensland and Central Queensland were partially completed at a total cost to date of almost $59 M with commissioning of 440 km of new transmission lines, new substations and extensions to existing substations.
- The second 350 MW unit at Tarong Power Station was brought into commercial operation on 1 May, lifting the State's total installed generating capacity to 4 824 MW.

Organisation, objectives of electricity supply industry

The principal purpose of the Electricity Act 1976-1984 is to provide the legislative framework within which a public supply of electricity is made available to consumers throughout Queensland.

Under this Act, the Queensland Electricity Commission is the arm of Government responsible for the regulation and co-ordination of the supply of electricity in the State.

- The Commission itself undertakes the forward planning of the electricity supply system and the generation and transmission of electricity which it supplies in bulk to the Electricity Boards and a few major consumers;
- It oversees the operations of Electricity Boards, exercising this function through its supervision of the annual budgets of these Boards and by reason of its membership of the Board of each authority;
- An important function of the Commission is the co-ordination and formulation of electricity supply industry policy in matters related to industrial awards and conditions of employment within the electricity supply industry;
- The Commission, through the various statutory bodies constituted for specific purposes, is responsible for electrical safety in its widest sense. Safety matters provided for under the Electricity Act include the approval of electrical articles, the certification of electrical workers and the licensing of electrical contractors.

Incidental to its principal functions, the Commission is authorised to encourage electrical research and development, offer technical advice and undertake work within and outside Queensland and to promote the efficient and economical use of electricity.

The Electricity Act Amendment Act 1984 provided among other things for the amalgamation of The State Electricity Commission of Queensland and the Queensland Electricity Generating Board. This arrangement (which had operated on a defacto basis for some time) was formalised by the Proclamation of the commencement of this Act from 1 January 1985.

Supply of electricity to consumers throughout the State is the responsibility of seven Electricity Boards — The South East Queensland Electricity Board, The South West Queensland Electricity Board, The Wide Bay-Burnett Electricity Board, The Capricornia Electricity Board, The Mackay Electricity Board, The North Queensland Electricity Board and The Far North Queensland Electricity Board.

Electricity supply to the South-west Queensland town of Goondiwindi and in the shires of Inglewood and Waggamba is provided by the North West County Council of New South Wales pursuant to a franchise agreement made under the Electricity Act 1976-1984.

Consultative Council

The Electricity Act Amendment Act 1984 expanded the membership of the Consultative Council by adding the Chairman of each Electricity Board to the previously existing membership of the Commissioner and the General Manager of each Board.

The Consultative Council is a statutory advisory body charged with advising the Commissioner and the Electricity Boards on matters of industry policy.

Its functions are not executive.

As formerly constituted, the Council met three times and the reconstituted Council, five.

With the present constitution of the Council, the Queensland Electricity Authorities Conference became redundant.

Commercial operation of No 2 unit at Tarong Power Station from 1 May enabled Tarong to meet up to 30 per cent of the State's electricity requirements.

Planning and Co-ordination Division

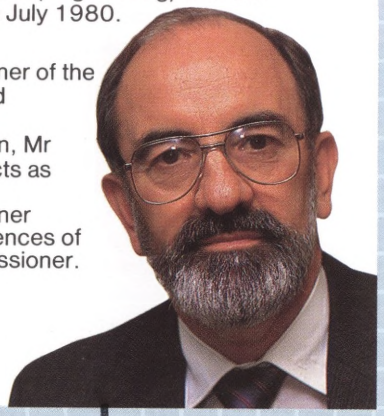
Planning and Co-ordination Division is headed by the Deputy Commissioner whose responsibilities encompass overall planning and co-ordination of the industry's activities on a Statewide basis. Until recently, the Deputy Commissioner also had been responsible for a small Corporate Planning Unit. Some former functions of this unit — manpower planning and staffing budgets — now have been transferred to Manager Employee Relations and the Commissioner has assumed personal responsibility for corporate planning.

JAMES RICHARD HAMILTON, M.I.E. Aust., Deputy Commissioner; formerly Deputy State Electricity Commissioner (Engineering) from July 1980; born and educated in Brisbane.

Mr Hamilton began his career in the electricity supply industry in 1948 as an electrical fitter/mechanic with Brisbane City Council. In 1955, he qualified as an engineer and subsequently held several senior positions with the council and the former Southern Electric Authority of Queensland.

In July 1977, he joined The Queensland Electricity Generating Board as Assistant General Manager Operations, then was appointed Deputy State Electricity Commissioner (Engineering) with the S.E.C.Q. in July 1980.

As Deputy Commissioner of the Queensland Electricity Commission, Mr Hamilton acts as Electricity Commissioner during absences of the Commissioner.



PLANNING DEPARTMENT

Load forecasting;

Investigating and planning future power stations and transmission systems;

Co-ordinating the Electricity Boards in planning the distribution system;

Negotiating with prospective major electricity users.

RESOURCES DEPARTMENT

Investigating, planning and arranging future fuel supplies;

Proving future coal resources in areas the Government sets aside for State use;

Investigating energy alternatives;

Encouraging development of alternative energy resources.

DISTRIBUTION CO-ORDINATION DEPARTMENT

Co-ordinating activities of Electricity Boards with those of the Commission;

Administering provisions of the Electricity Act relating to electrical safety, approval of articles, certifying electrical workers and licensing electrical contractors.

Planning Department

Future electricity requirements

Electricity sales during 1984/85 increased 8.0 per cent above the level in 1983/84. This increase reflected growth in the domestic sector and completion of several major electricity-using industrial projects. However, electricity production was affected by industrial action which resulted in loss of about 200 GWh of potential sales. Without this loss, the sales increase would have been about 9.4 per cent.

The Boyne Island aluminium smelter contributed strongly to the increase in electricity requirements in its first year of full operation. The mining industry also recorded substantially higher use than in the previous year, due to the completion of mines at Newlands, Curragh and Blair Athol and establishment of Kidston gold mine in Far North Queensland.

The long lead time for new power station projects requires planning decisions to be based on long-term forecasts of electricity requirements. Future electricity needs depend on many factors, including the international demand for export commodities from Queensland, the rate of economic growth, income and population trends and the prices and availability of alternative energy forms. Under the economic conditions which prevailed during the year, future changes in these factors could not be predicted with any great degree of certainty.Current forecasts of electricity requirements are based on population and economic growth rates lower than those experienced in the early 1980s and embody a slowing rate of growth in consumption among existing consumers.

Queensland has significant potential for industrial development but further development of large industry using significant amounts of electricity will depend on the recovery of the Australian and international markets. Provision for such loads has been based on a modest recovery in the late 1980s and attraction of further developments in the long term on the basis of the State's resource endowments.

Projects now under construction which will require substantial supplies of electricity include the electrification of the Central Queensland coal railways and a steel-rolling mill at Acacia Ridge, in Brisbane.

Queensland's annual consumption of electricity is growing more rapidly than the winter peak demand which results in improved utilisation of generating plant.

A programme to install water heating load control equipment progressively throughout the State is reducing the growth in peak demands and will allow water heating energy requirements to be supplied more economically during off-peak periods. The higher growth of energy requirements relative to peak demand also results from changing patterns of use in the commercial and domestic sectors (where summer air-conditioning loads are becoming significant) and from the addition of large energy-consuming industries requiring continuous supply.

The accompanying figure shows forecast peak demands for the next decade and the expected requirements of the various consumption sectors.

Generation planning

Construction continued on three coal-fired power station projects which, when completed, will provide a sound base from which electricity needs throughout the State can be met until the mid-1990s. A total 3 500 MW of new generating capacity will be obtained with completion of power stations at Tarong (1 400 MW), Callide B (700 MW) and Stanwell (1 400 MW).

The first two generating units at Tarong were in operation at 30 June and the station was due for completion by the end of 1986. Callide B Power Station will be completed in 1989.

During economic uncertainty such as prevailed in 1984/85, the timing and extent of future growth in electrical demands proves difficult to assess. Under such conditions, it becomes important to maintain flexibility in timing new generating plant to avoid over-commitment while preserving the ability to supply new electrical loads as they arise. This flexibility has been provided by the Stanwell Power Station construction programme, where a final commitment has not been made for start-up of the first unit and the option of deferring to March1991 has been preserved.

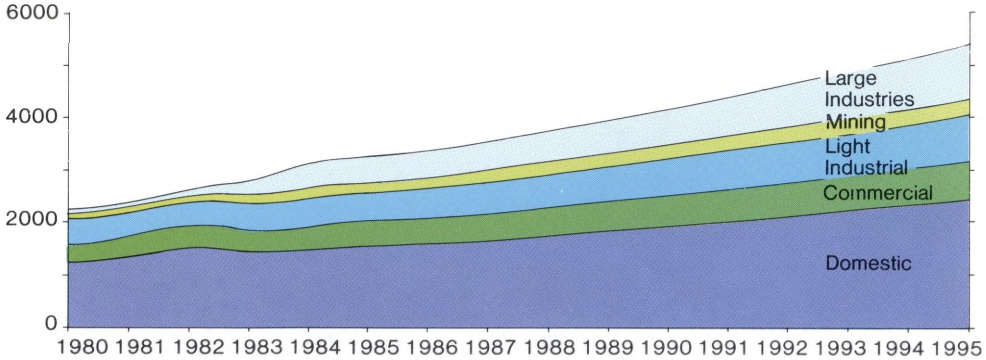
Following extensive investigations, the State Government approved acquisition of four sites on the Queensland coast to be reserved for future power stations using sea water for cooling. The sites were Abbot Point (near Bowen) 1 800 ha; Dudgeon Point (near Mackay) 1 700 ha; Broadmount (near Rockhampton) 1 865 ha; Raglan (between Rockhampton and Gladstone) 2 990 ha. The Government's action in acquiring these sites greatly reduced the likelihood of land use conflicts when the power stations are developed. It is intended that these sites will be built on over the next 40 or so years.

Base-load generation from coal-fired power stations will provide the bulk of the State's future electricity needs. However, there is a corresponding need to provide peak-load generating capacity from hydro-electric and pumped-storage sources operating in conjunction with coal-fired power stations.

Detailed investigations in South-east Queensland identified possible pumped-storage sites for preservation for future development. Population growth in this part of the State places considerable demands on available land. It was considered important to ensure that future pumped-storage projects can proceed in conjunction with other developments in the region.

An in-depth review also was being carried out of the hydro-electric potential of North Queensland to determine an order of preference for possible future developments. With Queensland's limited hydro-electric resources, feasible schemes in North Queensland will play a key role in regional development and in meeting overall State requirements.

PROJECTED ELECTRICITY DEMANDS
(Megawatts)



Transmission and bulk supply planning

High-voltage transmission system planning involves practical considerations of power station locations, load growth, environmental problems, cost analysis and the simulation of loads and plant in the future system. The availability of recently-developed static var compensators (used to maintain voltages under transient conditions), high-speed excitation systems for generators and reliable tele-control has allowed the operation of transmission lines at higher loadings than possible previously and thus has helped reduce overall cost.

Besides capital and operating cost, the criteria which influence transmission planning decisions are system performance and reliability. During the year, major projects investigated and approved included a large voltage-stabilising 260 MVAr static compensator at Nebo, a 275 kV feeder from Tarong Power Station to Middle Ridge, near Toowoomba, and two 275 kV feeders from Callide B Power Station to cut into an existing 275 kV feeder between Gladstone and Bouldercombe.

An unique project which required more than the usual investigation and analysis was the Central Queensland rail electrification scheme. This project will involve supply of single-phase power to thirteen 132/50 kV substations and nine static compensators for load balancing. This will be one of the world's largest applications of static compensators for this purpose.

Bulk supply planning, in conjuction with the seven Electricity Boards, included investigation of supply to 132 kV or 110 kV substations at Carole Park, West End, Caboolture and Lytton in the Brisbane area, and Charters Towers. Caboolture and Lytton substations will supply the Queensland Railways' suburban electrification scheme.

Boondooma Dam, near Proston, from which Tarong Power Station draws up to 28 gigalitres a year of cooling water — such inland water storages are scarce, necessitating acquisition of alternative coastal sites for future coal-fired Queensland power stations.

Resources Department

Fuel supplies

Coal continued to be the major energy source for electricity generation in Queensland and was used to supply 96 per cent of electricity generated. Fuel was drawn from nine suppliers under long-term contracts and another three regular suppliers under the direction of the Queensland Coal Board. All suppliers performed satisfactorily and, while there was some disruption to deliveries during February and March through industrial disputes, stocks were adequate to ensure uninterrupted operations.

Due to the general economic downturn, the coal mining industry faced a difficult period. State Government initiatives were taken to assist the industry, including one which allowed West Moreton coal suppliers some latitude in deliveries to Swanbank Power Station so as to achieve export sales.

As with other sectors of industry, cost increases occurred within the coal mining industry. While coal prices rose about 4.0 per cent, the greater use of low-cost coal enabled the Commission to hold down the average cost per tonne of coal delivered to its power stations.

Future coal supplies were assured. Most contracts extend into the 21st century and allowed for substantial increases in deliveries in the medium term. Because of continuing uncertainty in the growth of electricity demand (especially large industrial loads) and provisions for expansion of existing coal contracts, it should be some time before new contracts need to be arranged to supply coal to future power stations.

The Commission continued coal exploration in the Jellinbah Station area and established a further 70 M tonnes of open-cut coal to a measured status. This brought to 243 M tonnes the total open-cut coal within this area.

In conjunction with its work on future coal supplies, the Commission conducted a number of mine feasibility studies to establish indicative steaming coal costs which the industry would be likely to face in future years.

Energy alternatives

Although coal is seen as this industry's most-favoured energy source for the forseeable future, a watching brief was maintained on other energy resources likely to be suitable for economical electricity production.

Electricity authorities supplying the more-remote townships and those people who are beyond the limits of transmitted public supply normally have to rely on diesel-powered generators for electricity supply. The Commission has maintained its active interest in other energy sources for these areas.

One of the more promising possibilities might be the use of photovoltaic cells which convert sunlight into electricity to be stored in a battery which provides a continuous source of electricity. One of many problems with this potential power source is conversion of direct current from the battery to alternating current which is required by most domestic appliances. The Commission sponsored development work by the Capricornia Institute of Advanced Education to produce an improved design for equipment to carry out this task. This work seems to be progressing satisfactorily and could result in the operation within a year or so of a demonstration solar system which uses this conversion equipment.

A further development in which the Commission has an interest is the low-temperature Rankine-cycle engine. This machine is designed to produce electricity from a low-temperature energy source such as the hot water from a solar pond or, of special interest to Queensland, the hot water of the Great Artesian Basin. A prototype machine of 20 kW electrical output was operating on hot water produced in a solar pond at Alice Springs. An application has been made to the National Energy Research, Development and Demonstration Programme for funds to develop a 100 kW machine to operate on hot water from the Birdsville town bore.

The possibility is being investigated of harnessing wind energy to reduce the load on diesel-engined generating sets supplying remote townships. As Thursday Island appeared to be a promising location, monitoring equipment has been installed to assess the potential wind energy as a first step in deciding on the viability of the system at that site.

Coal continued to be the main fuel used for electricity production in Queensland, being used in generating up to 96 per cent of the output from all stations.

Distribution Co-ordination Department

Isolated generation

Internal combustion power stations continued supplying electricity in those western towns and rural areas which had not been supplied from the interconnected grid. Such stations were operated by The Far North Queensland Electricity Board, The North Queensland Electricity Board, The Capricornia Electricity Board and The South West Queensland Electricity Board.

Public electricity supply in Karumba was provided by The Far North Queensland Electricity Board's bulk purchases from A. Raptis and Sons, while The North Queensland Electricity Board bulk purchases from Mount Isa Mines Limited were used to provide public electricity supply in Mount Isa, Cloncurry and the adjacent rural areas. From 1 December, the small power station at Dajarra was placed on standby when supply to the township was connected through a SWER line from Mount Isa.

Despite some restrictions on the use of electrical articles in some locations supplied from isolated power stations, demand for electricity grew steadily. Of the 18 power stations operated by the Boards, the installed capacities of six were increased; Thursday Island (by 220 kW), Burketown (80 kW), Camooweal (40 kW), Jundah (174 kW), Charleville (890 kW) and Thargomindah (70 kW).

Distribution — area reinforcement and extensions

Continued growth in distribution works was required to cater for population growth in many areas of the State. The fringe areas of Brisbane and coastal resorts were the main growth areas in the south of the State, while tourism developments played an important role in the north.

This necessitated capital expenditure for extensions into new areas and reinforcement of the system generally. The latter involved increases in transformer capacity, construction of additional high-voltage lines, an increase in size of existing conductors and construction of new substations.

Electricity Boards provided assistance on a recoverable-cost basis in the design, construction and maintenance of electricity supply schemes at Aurukun and Mornington Island and at various aboriginal communities where electricity supply is the responsibility of the Department of Community Services.

Rural electrification

The Rural Electricity Subsidy Scheme was introduced on 1 July 1978 to provide financial assistance in completing rural electrification of the State to the maximum extent feasible.

Provision was made in the scheme for electricity supply to small townships which did not have a public electricity supply and to groups of rural properties.

Although State Government participation in the scheme ended during 1982/83 when the allocated subsidy of $6 M was exhausted, the scheme continued to operate under the same subsidy conditions but using industry funds.

Apart from some areas supplied by The Capricornia Electricity Board and possibly in the Quilpie Shire, the limits of economical and practical rural electrification mostly have been met.

Inspectorial, safety and approvals activities

Regular planned inspections in Electricity Boards' areas of supply and license areas continued. Particular attention was given to the use of safety equipment and safe working practices. In all areas visited, works generally were found to be satisfactory and in accordance with accepted industry standards.

Checks made on persons performing electrical work indicated there was much greater awareness of the statutory requirements.

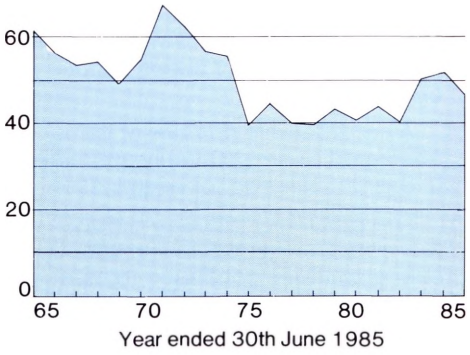
Inspectorial staff provided assistance to the Electrical Workers and Contractors Board in inspections and examinations of electrical workers and the investigation of defective and dangerous work.

Electrical inspectors also assisted the Queensland Electrical Education Council in its public safety campaign.

Policing was maintained of electrical articles offered for sale to ensure compliance with the relevant provisions of the Electricity Act 1976-1984. This rewarding task, which ensures electrical articles offered to the public are safe, has met with the ready cooperation of manufacturers, wholesalers and retailers on the comparatively few occasions when defects requiring correction have been discovered.

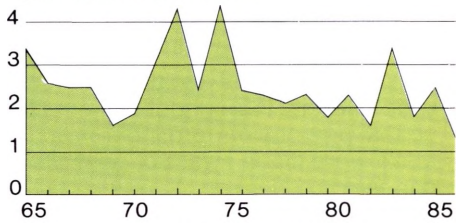
Officers served on various technical committees of the Standards Association of Australia, the International Electrotechnical Commission and the Electricity Supply Association of Australia.

ELECTRICAL ACCIDENTS
per 100 000 Consumers



Year ended 30th June 1985

ELECTRICAL FATALITIES
per 100 000 Consumers



Year ended 30th June 1985

During the year, there were 12 fatal accidents, compared with 24 in 1983/84. The total number of electrical accidents reported to the Commission fell from 487 to 432 in 1984/85. Most occurred on domestic premises.

There were 44 accidents involving employees in the electricity supply industry, compared with 31 in the previous year.

A detailed analysis of accidents on consumers' premises showed the main causes of accidents were lack of maintenance, contact with overhead wires and unauthorised work. Publicity advising the public of the dangers associated with misuse of electricity continued.

The electrical education programme conducted for Grade 8 secondary school students continued. Investigations were made to determine whether this school level (which was selected some years ago) still was appropriate or whether the programme should be transferred to a different year or extended to include students in other primary or secondary grades.

Discussions continued between the States to obtain a greater measure of uniformity in prescribing definitions. Amendments to several definitions were gazetted on 1 September to ensure greater uniformity throughout Australia.

The number of prescribed articles submitted was comparable with previous years but excessive delays were experienced in the time taken for testing due to the industrial problems within the electricity supply industry early in 1985.

A considerable number of items continued to be voluntarily submitted to the Commission for examination.

The Electricity Industry Safety Advisory Committee and its various subcommittees continued to meet regularly to review training and the achievement of safe working conditions throughout the Queensland electricity industry. Consideration of accident reports enabled developing trends to be identified so that action could be taken to educate personnel to avoid potentially hazardous practices and procedures.

Serious and fatal accidents received wide publicity throughout the industry so that persons performing similar tasks were made aware of possible dangers.

Subcommittees continued to hold meetings outside the metropolitan area. Visits were made to Townsville, Dalby and Mackay.

The industry resuscitation booklet and training film both remained in constant demand in Queensland and throughout Australia.

The Electrical Workers and Contractors Board

The Electrical Workers and Contractors Board, charged with implementing that part of the Electricity Act 1976-1984 dealing with electrical workers and contractors, undertook a review of training and examinations for electrical jointers and subsequently updated training procedures and examinations.

Help in the review came from the Department of Technical and Further Education and the Underground Mains Projects Department of The South East Queensland Electricity Board (which helps in training and examining to determine the level of competence of applicants for certificates of competency).

Fewer electrical trades people from interstate and overseas (including New Zealand) sought Queensland certificates of competency. Reciprocal arrangements now exist which ensure Queensland certificates are available to these tradesmen with minimal delay.

The Board arranged preliminary theory and practical trade tests for certain applicants, including some migrants, to determine whether further study or experience was needed for them to qualify for a certificate of competency.

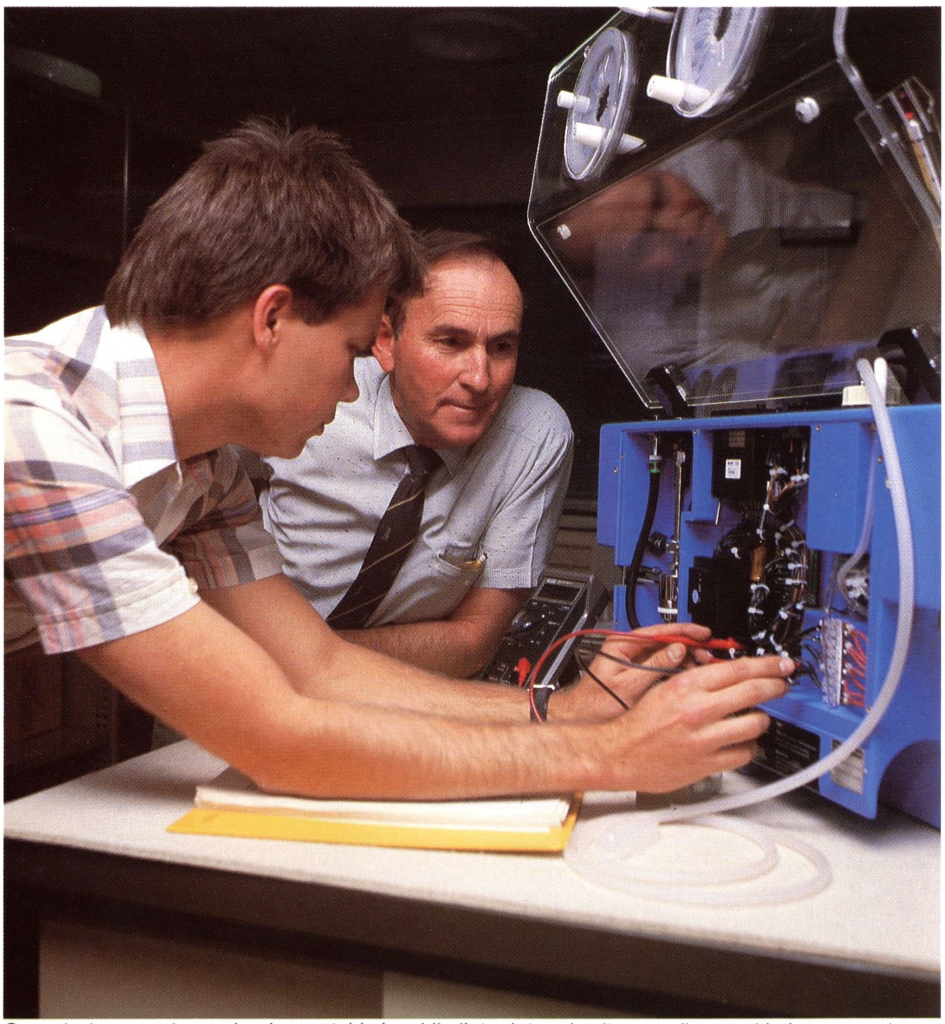
During the year, 145 applicants or their nominees were advised that they would need to undertake the Board's examination to qualify for an electrical contractor's licence. One hundred and eight applicants attempted the examination.

Ninety four licence holders surrendered their licences for cancellation and, at 30 June, the number of licences still current was 4 045.

A total 1 378 certificates of competency was issued in the categories of electrical fitter, mechanic, linesman and jointer, as well as 210 restricted certificates of competency.

Close liaison was maintained with the Chief Inspector of Factories and Shops, the Industry and Commerce Training Commission and the Department of Technical and Further Education. The Department of Education conducted trade tests throughout the State for the Board.

In the interests of public safety, the Board continued regular checks to ensure only persons with the appropriate certificate of competency or permit were performing electrical work and only those people, firms or companies issued with an electrical contractor's licence were performing electrical contracting work. Electricity Boards helped police the Act by drawing attention to illegal and unauthorised electrical work.



Commission examiners check a portable humidicrib to determine its compliance with the appropriate electrical standards.

Corporate planning

The Commission's Corporate Planning Officer co-ordinated reviews of the industry's planning and financing performance over the past few years as well as its goals for the next five.

The review of goals was of great value in planning to meet the challenges of the coming five years; benefits already have accrued, particularly in setting the 1985/86 budgets and in forecasting for 1986/87.

Generation and Transmission Undertaking

The Generation and Transmission Undertaking consists of three main Divisions which report to the General Manager either directly (Operations and Transmission) or through the Deputy General Manager (Generation Development).

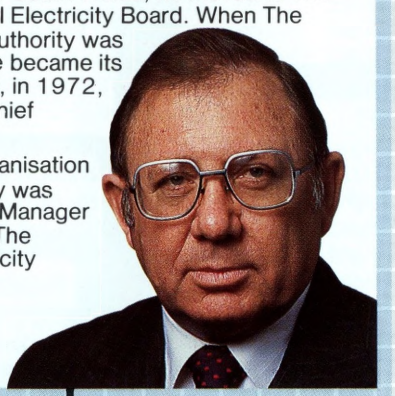
The Deputy General Manager assumes line responsibility for the Generation Development Division and acts as General Manager when the General Manager is precluded from personally carrying out any functions of his office.

The General Manager personally oversees a small specialist Contract Services Group which ensures tender specifications are properly prepared and documented, tender analysis conforms with the law and conditions of tendering and that the commercial aspects of every contract entered into by the Commission are properly administered.

FREDERICK ALEXANDER McKAY, B.E., B.A., F.I.E. Aust., General Manager — responsible for generation and transmission functions; born and educated in Sydney.

Mr McKay first joined the electricity industry in 1952 following several years in irrigation and dam construction. After two years with the Electricity Commission of New South Wales, he moved to The Townsville Regional Electricity Board. When The Northern Electric Authority was formed in 1964, he became its Chief Engineer and, in 1972, its Chairman and Chief Executive.

With industry reorganisation in 1977, Mr McKay was appointed General Manager (and Chairman) of The Queensland Electricity Generating Board.



CONTRACT SERVICES GROUP

OPERATIONS DIVISION

Operating generating facilities;

Controlling operations of the transmission system;

Scheduling maintenance of generation and transmission facilities.

TRANSMISSION DIVISION

Designing transmission system;

Constructing new transmission, distribution and bulk supply facilities;

Maintaining all existing facilities in transmission grid;

Administering the training of tradesmen;

Administering the commission's vehicular fleet.

NEIL HERBERT DAVIS, B.E., M.I.E. Aust., Deputy General Manager — responsible for the development of the Commission's generating facilities; born in Sydney and educated in Brisbane.

Mr Davis has been employed in the Queensland electricity supply industry since graduating from University of Queensland in 1944. In 1973, after 29 years of power station operation and management, he moved to the development side.

In 1977, he was appointed Assistant General Manager Development of The Queensland Electricity Generating Board, responsible for the planning and development of the Board's generation and transmission facilities.

GENERATION DEVELOPMENT DIVISION

GENERATION DESIGN DEPARTMENT

Co-ordinating design in mechanical, civil and electrical areas for new power stations;

Providing architectural services;

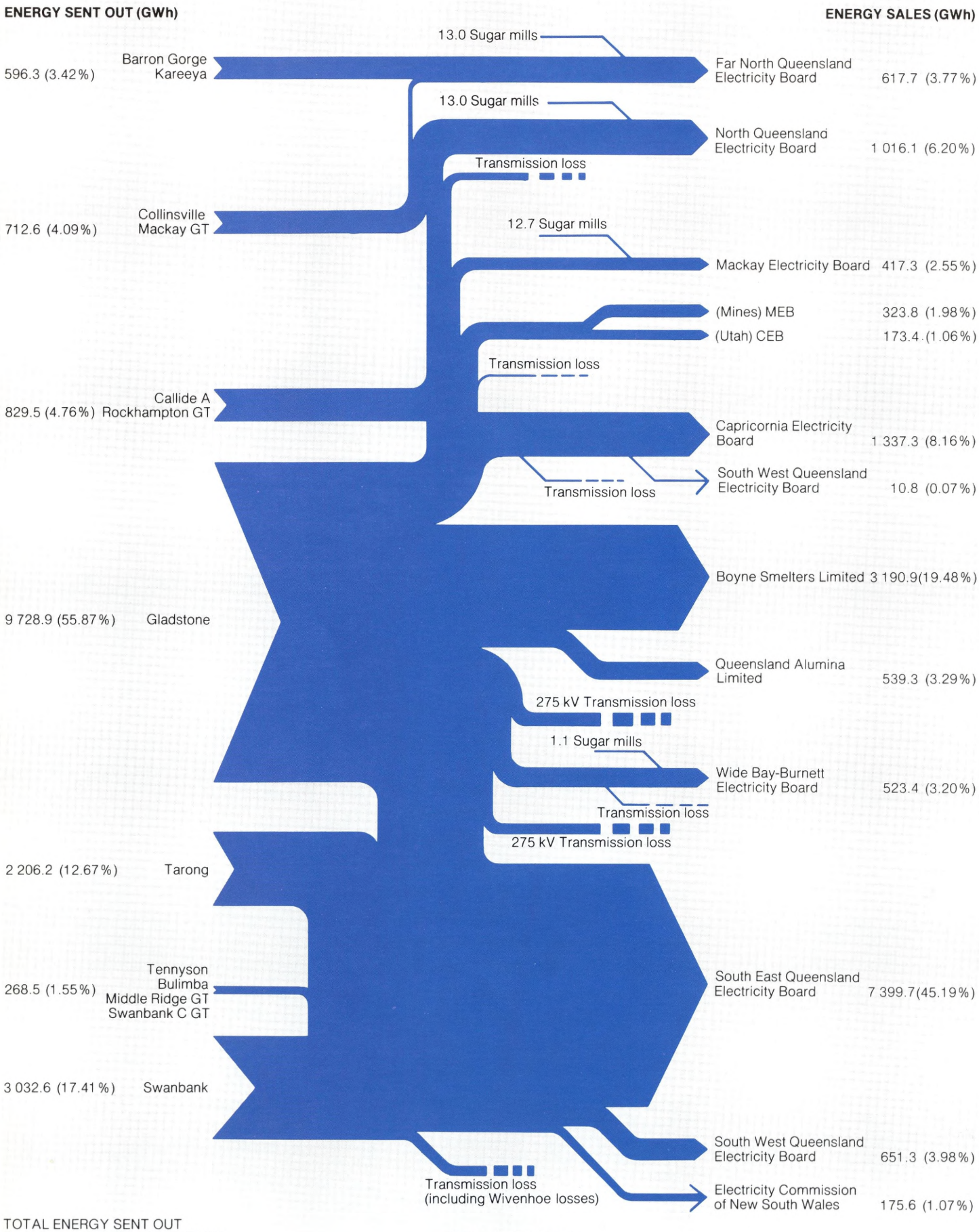
Offering quality assurance services;

Investigating environmental, engineering, chemical and metallurgical aspects of Commission operations.

TARONG PROJECT, CALLIDE B PROJECT, STANWELL PROJECT

Three separate Departments, each of which is responsible for administering, co-ordinating and controlling all aspects of project development and commissioning for new power stations.

1984/85 Energy Balance



Operations Division

Generation operations

The Commission's total installed capacity rose 14.0 per cent to 4 824 MW with the addition of the final Wivenhoe unit (250 MW) in August and the second 350 MW unit at Tarong Power Station on 1 May.

Gladstone Power Station was the Commission's major energy producer, responsible for 55.0 per cent of total generation, compared with 61.7 per cent in 1983/84. Tarong generation increased from 3.7 per cent of total generation in 1983/84 to 13.3 per cent, with consequent reductions in production at Gladstone, Swanbank, Tennyson and Bulimba power stations.

Security of supply to North Queensland again improved during the year due to better performance from Collinsville Power Station, greater generation at Kareeya and Barron Gorge hydro stations following good summer rains and extension of the 275 kV transmission network to Townsville in May.

Tarong Power Station generated 2 447 GWh, 374.0 per cent more than in 1983/84. Of this total, 352 GWh was produced by No 2 unit before it started commercial operations. The unit was first synchronised with the system on 11 February and entered commercial service on 1 May.

The equivalent availability achieved by No 1 unit over the year was 73.0 per cent. This figure was considerably better than the 59.0 per cent expected for the first year of operation and was attributable to lower-than-expected levels of planned maintenance. Early problems with feed pumps and their fluid couplings and investigations into the effects of a chemical contamination of the boiler feedwater in December were the principal causes of unplanned loss of production.

Gladstone Power Station generated 10 156 GWh, 1.7 per cent lower than in 1983/84. The decrease was due mainly to a decrease in the equivalent availability of the station to 79.0 per cent (from 84.1 per cent in 1983/84) and to a transfer of energy production to Swanbank in October and February to conserve coal stocks at Gladstone when deliveries were affected by industrial action at coal mines.

In August, station energy production exceeded 1 000 GWh in one month for the first time. The record energy of 1 027 GWh was attributed to good availability and increased overnight load caused by the operation of Wivenhoe pumped-storage station.

Swanbank Power Station produced 3 296 GWh. Although this generation was 3.2 per cent lower than in 1983/84, it was 10.9 per cent higher than anticipated due to energy production transfer to Swanbank during strikes and coal stockpile problems at Gladstone Power Station.

B station equivalent availability increased to 87.2 per cent (from 78.3 per cent in 1983/84) and A station availability dropped from 84.0 per cent to 72.0 per cent.

In July, A station No 5 unit boiler casing was damaged by a furnace pressure fluctuation after a load change caused by a planned Wivenhoe pump trip. The unit was out of service for almost four weeks.

Tennyson and Bulimba power stations generated 302 GWh, 1.6 per cent of the State total and a 42.7 per cent reduction on 1983/84. Total generation in April, May and June was reduced to only 34 GWh by the effect of commissioning generation from Tarong No 2 unit. With Tarong Nos 3 and 4 units due for commissioning in February and November 1986, energy production from Tennyson and Bulimba power stations will be further reduced.

Callide A Power Station continued to operate as a base-load station during the year. Energy generated totalled 886 GWh, an increase of 20 GWh.

Equivalent availability was lower at 82.5 per cent (84.2 per cent in 1983/84), due in part to a prolonged outage of No 3 unit from 18 February to 14 March. Repairs to a faulty generator transformer tap changer were delayed by the major industrial dispute in February and did not start until Electrical Trades Union members returned to work on 5 March.

Final acceptance tests on the modified flue gas fabric filters were successfully completed on all units in March. Filter efficiencies were of the order of 99.6 per cent.

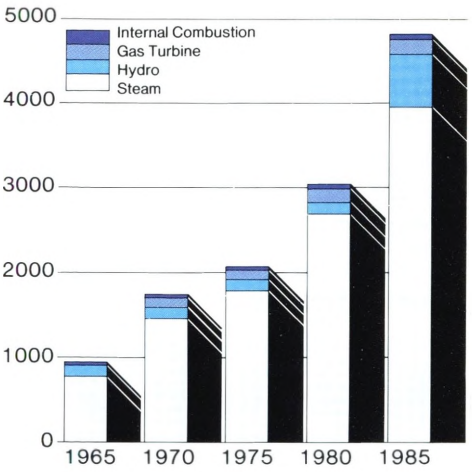
Collinsville Power Station generated 768 GWh, 6.1 per cent more than in the previous year. Equivalent availability of the 30 MW units continued to improve, increasing from 58.9 per cent in1983/84 to 71.1 per cent. Availability of the 60 MW unit increased to 59.9 per cent from 56.7 per cent. With the improvement to security of the northern region from extension of the 275 kV transmission network to Townsville, the level of generation required at Collinsville was expected to decline.

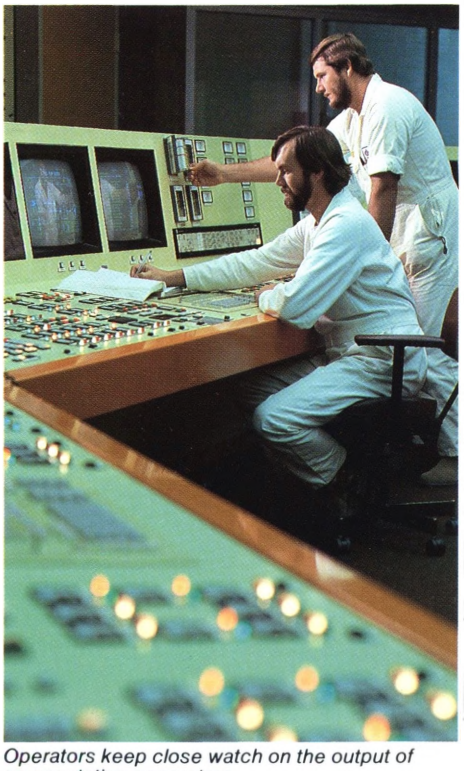
Kareeya Hydro-electric Power Station generated 414 GWh, 28.0 per cent more than in 1983/84. Good rains in February, March and April caused the storage level to rise from 31.0 per cent in early February until spilling over the top of the fabridam occurred on 11 April. Spilling continued until 30 April.

Barron Gorge Hydro-electric Power Station produced 186 GWh, 44.4 per cent above the previous year. Tinaroo Dam storage rose to 97.4 per cent on 9 June.

The gas turbine power stations produced 5.6 GWh, representing 0.03 per cent of the State total, of which 1.6 GWh was generated to supplement the restricted output of the main generating stations during the major industrial dispute in February.

INSTALLED GENERATING PLANT (MW)





Operators keep close watch on the output of power station generators.

System operations

The maximum demand on the Commission's interconnected system of 3 308 MW on 3 July was 14.8 per cent higher than that of 1983/84 and resulted from a very cold air mass covering most of Queensland which brought snow to some areas of the Darling Downs.

Energy sales during the year totalled 16 377 GWh, an increase of 7.8 per cent over those of 1983/84. Sales to the Commission's largest industrial bulk supply customer, Boyne Smelters Ltd, were a major factor in sustaining the growth rate. Excluding Boyne Smelters and Queensland Alumina Limited, energy sales increased by 4.8 per cent compared with 4.3 per cent the previous year.

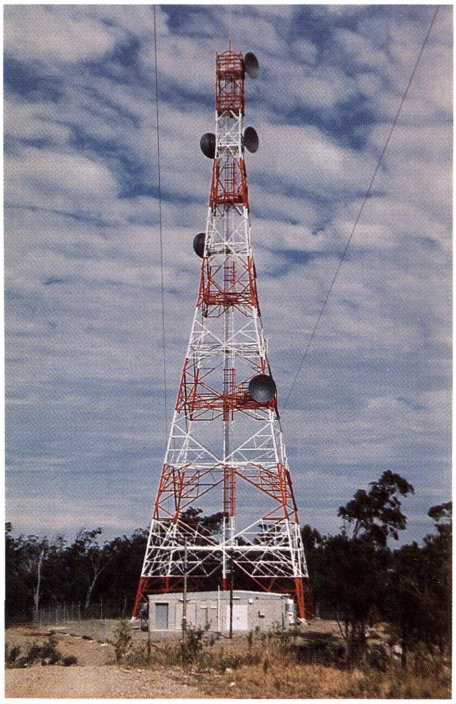
Most generating plant failures were contained with available spinning reserve and with Wivenhoe and gas turbine quick-start operation. On two occasions when generation availability had been seriously reduced because of concurrent problems at Tarong and Gladstone power stations, domestic load shedding was averted only by reducing peak demands with the switching off of hot water services controlled by The South East Queensland Electricity Board, voltage controlled load reductions in the same Board's area and, on one occasion, by also grounding coal mining dragline buckets.

The second stage of the new State Control Centre in Brisbane was completed, providing up-to-date facilities for day-to-day planning, monitoring and controlling the interconnected system with maximum economy and security.

Work progressed well towards improvement of facilities at Brisbane South Area Control Centre. A contract was awarded for the supply and commissioning of a small computer-based control system, progressive installation of which had started towards service in March 1986.

The new Rockhampton Area Control Centre building was completed, enabling full use of the new workshop facilities by communications staff. Uninterruptible power supply equipment and other facilities had been installed and installation of the control system equipment was continuing. The centre was due for operational service early in 1986.

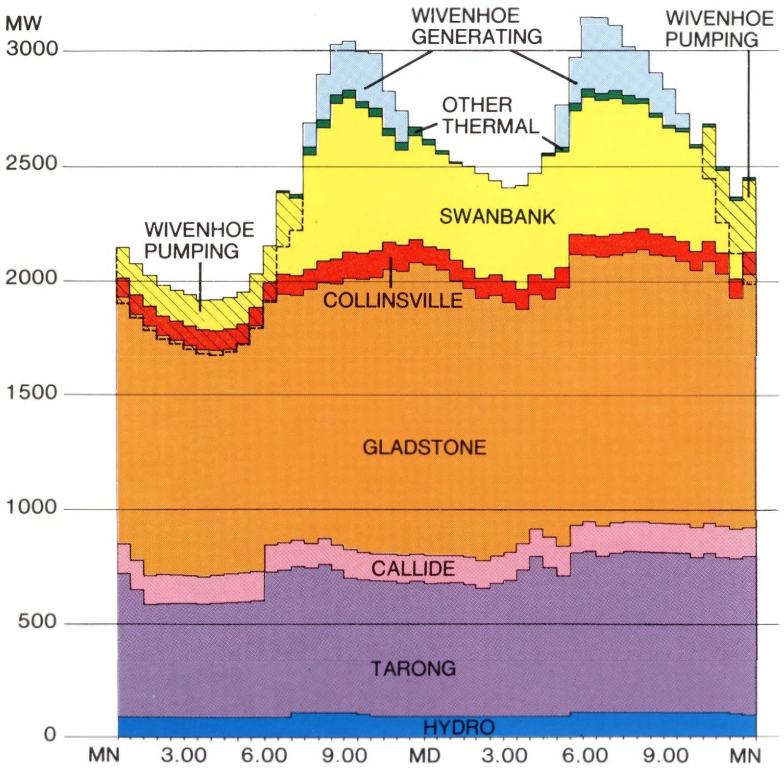
Installation and testing of a microwave radio system to provide communication links between major installations in Central Queensland was almost completed, with final commissioning expected in August 1985. This project involved design and installation of five repeater stations and seven towers, of which the tallest at Maurice Hill (west of Gladstone) was designed to carry 13 parabolic antennae at varying heights.



This steel box tower, 65 m high, was erected at Maurice Hill, near Gladstone, to support microwave communications antennae.

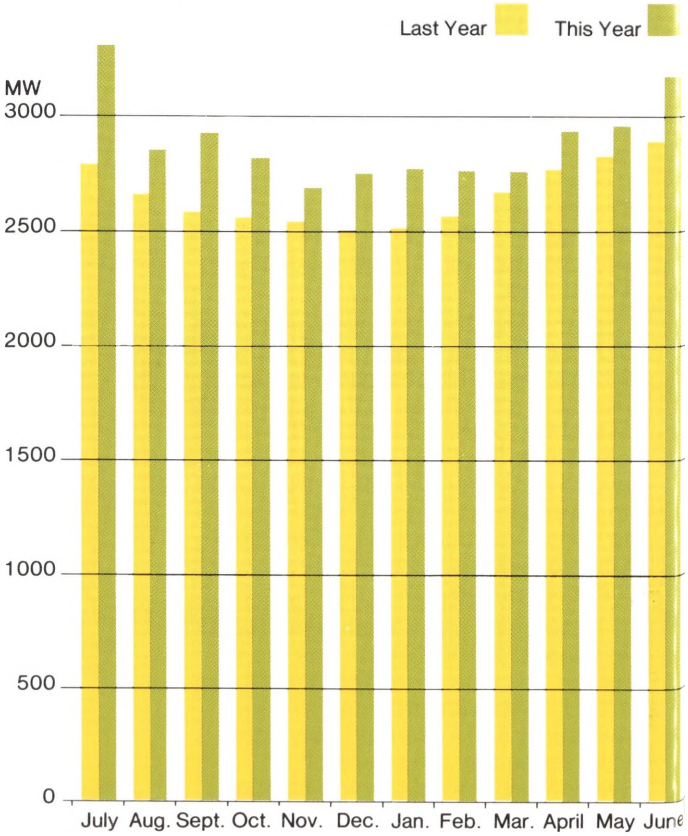
TYPICAL WEEKDAY DEMAND CURVE

June 1985



MONTHLY MAXIMUM DEMANDS

Interconnected Generation, Central, Southern & Northern Regions



Transmission Division

Development works — interconnected system

Project completion and commissioning were the dominant features of the year's activities.

Transmission lines in service increased by 12 per cent from 8 679 to 9 723 circuit kilometres, four new substations were commissioned and extensions at 12 others were put into service. Further indications of growth were an increase in the number of circuit breakers in service — up 4.7 per cent from 738 to 773 — and in installed step-down transformer capacity at voltages of 110 000 or above — up 8.6 per cent from 8 516 MVA to 9 247. Despite this growth, the Transmission Division staffing level was held to an increase of only 0.4 per cent.

The year saw completion of major extensions to the 275 kV transmission system reinforcing supply to North Queensland and Central Queensland. The northern reinforcement was made by a 331 km extension from Nebo (south-west of Mackay) to a new 275/132 kV substation at Ross (near Townsville). Supply within Central Queensland was reinforced by construction of a 109 km 275 kV transmission line from a new switching station at Broadsound to Lilyvale, where a 275 kV section was constructed at the existing 132/66 kV substation.

The northern extension increased the transmission system transfer capacity and greatly improved operational security. The central extension provided further high voltage transmission capability to allow for increased loads for coal mines, extensions of the system further west and for the Central Queensland railway electrification project.

A novel feature of the new 275 kV substations at Ross, Broadsound and Lilyvale was use of an integrated computer system for local and remote control and indication, alarm processing and event recording.

A second 275 kV generator transformer feeder was commissioned at Tarong and the second stage of transmission from the power station was completed with commissioning of the 108 km Tarong-Mt England double circuit transmission line. One circuit connects directly with a 40 km circuit from Swanbank Power Station, previously open-ended at Mt England. Transmission capacity from Tarong was made particularly secure, with direct 275 kV connections to Mt England and Swanbank added to the initial South Pine connection.

A $6 M contract was awarded for construction of a 110 km double circuit 132 kV transmission line from Kareeya to Turkinje on the Atherton Tableland, due for completion in August 1986. Centreline survey was complete and full-width clearing well advanced on this project which will provide major reinforcement to Far North Queensland.

The Central Queensland railway electrification project, Blackwater to Gladstone and Goonyella to Hay Point, will involve 15 substations (12 new and nine with static var compensators) and 11 new 132 kV transmission line sections totalling 254 km. A $20 M contract was awarded for the supply and erection of the static var compensators and several other contracts were about to be or had been awarded. Transmission line clearing and substation civil works had started at several sites, three of which — Callemondah, Wandoo and Rocklands — are due for commissioning between April and June 1986.

Transmission engineering

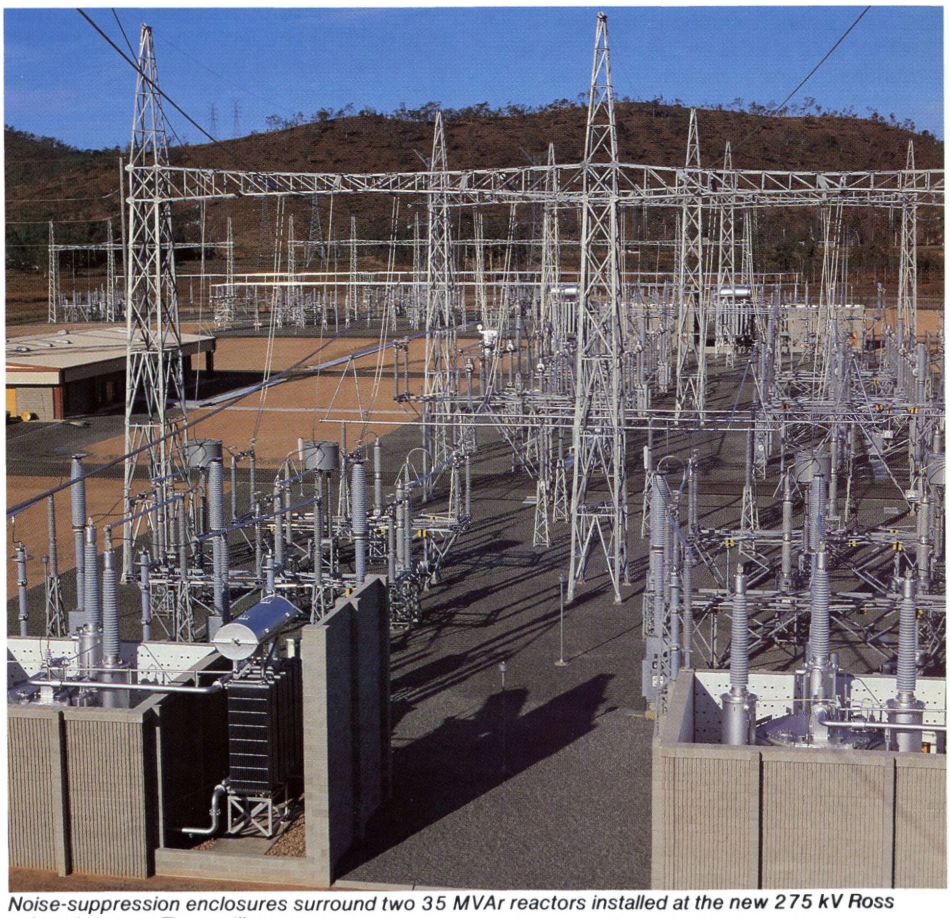
The use of "total station" theodolites for engineering survey of transmission lines was introduced, realising faster survey times and quick, reliable computation of data. Survey data which are read and stored electronically can be transferred directly from the field recorder to a computer for production of survey plans.

Eight lightning flash counter installations were erected in Central Queensland and North Queensland and a recording programme initiated with the assistance of the Department of Primary Industries and the Queensland Water Resources Commission. The programme, to run for at least 11 years, will give better knowledge of lightning intensities and help improve transmission line design.

Design, development and testing was completed on a new range of 132 kV double circuit steel towers for use with lightweight conductors. The range included an innovative suspension tower with restrained synthetic insulators for line deviation angles up to ten degrees which will realise a saving in steel costs and improve flexibility in route planning.

Southern Region

Network reinforcement included 132 kV bulk supply to The South East Queensland Electricity Board's Noosaville feeders from Cooroy. At Loganlea, major 110 kV extensions



Noise-suppression enclosures surround two 35 MVAr reactors installed at the new 275 kV Ross substation, near Townsville.

included commissioning of a second circuit from Belmont, transformer switching and provision for future 110 kV bulk supply.

Extensive 110 kV busbar rearrangement at Nambour enabled recovery of a potentially hazardous 30 year-old tower and beam structure. At Middle Ridge (Toowoomba), 110 kV busbar rearrangement involving relocation of seven 110 kV feeder terminations was almost finished in readiness for 275 kV establishment in April 1987. Tenders were called for construction of the 109 km 275 kV Tarong-Middle Ridge transmission line.

A $9 M contract was awarded for construction of the 315 km double circuit 132 kV Tarong/Chinchilla/Roma transmission line. Line clearing between Chinchilla and Roma was almost complete, tower foundations were well advanced, work had started on a new substation at Roma and the overall project was proceeding on schedule.

Electrical erection of a new bulk supply substation started at Redbank Plains and design was in hand for extensions at Caboolture and from Bulimba to Lytton to cater for railway electrification.

Central Region

A new 132/66/11 kV substation at Barcaldine was commissioned together with a 260 km concrete pole transmission line fed from a 132 kV extension to Clermont Substation. This provided power from the coastal grid system to The Capricornia Electricity Board's central western system based on Barcaldine and Longreach, permitting a run-down of diesel generation at Barcaldine. This project and the Ross/Kidston line (in Northern Region) were significant in their use of concrete poles which resulted in establishment of a manufacturing plant in Rockhampton by the pole supplier.

Other works completed included transformer and cable uprating to cater for increased loading at Queensland Alumina and a new stores building in the Gladstone Power Station switchyard allowing expansion of communications equipment into the previous stores area.

Two 60 MVA transformers about to be installed at Moura in place of existing 34 MVA units under a $1 M contract will provide for increased mining load.

Northern Region

Supply to The Far North Queensland Electricity Board for Kidston gold mine was achieved in November ahead of schedule. A new 132/6.6 kV bulk supply substation was commissioned at Kidston, fed initially from Townsville South via a 21 km circuit to the future Ross Substation, connected direct to a new 293 km concrete pole line between Ross and Kidston. On commissioning in May, Ross Substation began supplying Kidston and was connected by two 132 kV circuits to Garbutt and by a further two to Townsville South.

Network reinforcement included transformer changes at Proserpine and Garbutt. The shunt capacitor bank at Mackay was uprated and relocation of capacitors from Innisfail to Cairns resulted in improved voltage distribution. Further reinforcement scheduled for next year was being designed, including additional transformers at Garbutt and Cairns. At Cairns, a new 21-panel 22 kV switchboard was planned with decommissioning of 15 panels rendered obsolete by increased system fault levels.

Operation of main transmission system

Transmission system performance was good, maintaining high reliability of supply to the 60 bulk supply substations. Load losses through transmission problems totalled 0.434 GWh, or 0.003 per cent of total units sold. Three incidents accounted for 76 per cent of this total: a storm caused outage of both 132 kV circuits to Boyne Smelters during which reclosure was delayed by a design problem (0.19 GWh); failure of a busbar support insulator in Collinsville Power Station 132 kV switchyard (0.075 GWh); and inadvertent separation of the Northern Region system during control panel extension work at Nebo (0.033 GWh).

Industrial disputes had a serious effect on the economy of operation. Normal operation was affected nine times, with rotational load shedding required on four occasions and rationing orders invoked on three others.

The most serious event occurred from 12 to 21 February when output from power stations was reduced to 50 per cent of available capacity through unauthorised operator action in support of a strike by Electrical Trade Union members employed by The South East Queensland Electricity Board. This dispute accounted for about 200 GWh of the estimated 227 GWh load lost through industrial action on five occasions during the year.

Depot employees also took part in the three-week strike in February. While maintenance work was not done at that time, this did not result in any serious outages either at that time or since.

Inspection, testing, manufacturing and repair services to all areas were provided by the Southern Region workshops at Northgate, where investigations continued into the development of possible monitoring devices for incipient defects in instrument transformers. On several occasions, acoustic fault location equipment developed at Northgate was used to pinpoint the source of gassing or partial discharge in large power transformers.

Transport

The Commission's motor vehicle fleet of 533 units travelled 11.5 million km during the year, an average of 21 500 km per vehicle. Of these vehicles, 130 are specially-equipped four-wheel-drive units used in rough or boggy terrain on survey work and transmission line construction and maintenance.

Mobile plant items totalled 356 at 30 June following purchase of two large bulldozers for coal stockpile maintenance at Swanbank and Tarong power stations.

High utilisation of all vehicles and mobile plant was achieved and fleet growth was minimal. The number of diesel-engined vehicles increased, offering lower fuel consumption and improved availability through reduction of maintenance downtime. Downtime reductions also were achieved by an improved maintenance management system.

Contract Services Group

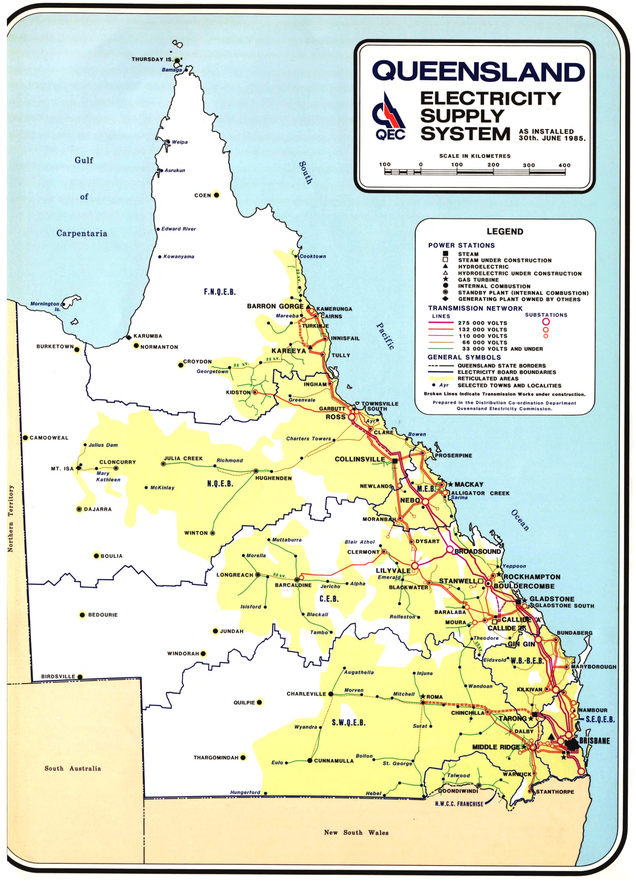
A total of 93 contracts was placed for works costing $112.2 M for the power generation and transmission system. Of this amount, $45.2 M related to contracts for power station projects and $66.9 M related to transmission contracts.

The first phase of the computerised contract management system — the contract register — was implemented and 250 contracts with a total value in excess of $1 450 M were loaded into the system. Implementation of subsequent phases of the system depends on the successful and economical completion of the first stage.


INTERCONNECTED SUPPLY SYSTEM
NORTH QUEENSLAND
SCALE IN KILOMETRES
50 0 50 100
(FOR LEGEND REFER TO MAIN MAP)
FAR NORTH QUEENSLAND ELECTRICITY BOARD
NORTH QUEENSLAND ELECTRICITY BOARD
CAPRICORNIA ELECTRICITY BOARD
MACKAY ELECTRICITY BOARD
Cooktown
Daintree
Mossman
Mt. Carbine
Mt. Molloy
BARRON GORGE
CAIRNS
KAMERUNGA
Mareeba
TURKINJE
Chillagoe
Dimbulah
Atherton
Ravenshoe
Mt. Garnet
INNISFAIL
KAREEYA
TULLY
Mt. Surprise
Einasleigh
INGHAM
KIDSTON
Ingham
Townsville
GARBUTT
ROSS
CONDEVILLE SOUTH
Mingela
CLARE
Charters Towers
Ravenswood
Dalbeg
Bowen
Pentland
Cape Pera
COLLINSVILLE
PROSERPINE
HUGHENDEN
Torrens Creek
Prairie
Stamford
Eungella Dam
NEWLANDS
Glendon
MACKAY
ALLIGATOR CREEK
Sarina
GONDOLE
NEBO
WANDOO
Carmila
MORANBAH
MORANBAH SOUTH
COPPABELLA
PEAK DOWNS
St. Lawrence
MT. McLAREN
DYSART
NORWICH PARK
Blair Athol
Mattaburra
South Pacific Ocean


INTERCONNECTED SUPPLY SYSTEM
SOUTH QUEENSLAND
SCALE IN KILOMETRES
50 0 50 100
(FOR LEGEND REFER TO MAIN MAP)
275 kV. SUBSTATIONS
A BELMONT
B SOUTH PINE
C MT. ENGLAND
POWER STATIONS
1 TENNYSON
2 BULIMBA
3 SWANBANK "A"
4 SWANBANK "B"
5 SWANBANK "C"
MACKAY ELECTRICITY BOARD
BROADSOUND
LILYVALE
CAPRICORNIA ELECTRICITY BOARD
ROCKHAMPTON
BOULDERCOMBE
STANWELL
GLADSTONE
GLADSTONE SOUTH
CALLIDE 'A'
CALLIDE 'B'
BARALABA
BILOELA
MOURA
GIN GIN
BUNDABERG
MARYBOROUGH
WIDE BAY - BURNETT ELECTRICITY BOARD
KILKIVAN
WOOLOOGA
GYMPIE
SOUTH EAST QUEENSLAND ELECTRICITY BOARD
SOUTH WEST QUEENSLAND ELECTRICITY BOARD
TARONG
ROMA
DALBY
WIVENHOE
MIDDLE RIDGE
BRISBANE
SOUTHPORT
BURLEIGH
SURFERS PARADISE
MUDGEERABA
TERRANORA
K.W.C.C. FRANCHISE
GOONDIWINDI
STANTHORPE
New South Wales
South Pacific Ocean


INTERCONNECTED SUPPLY SYSTEM
MORETON REGION
SCALE IN KILOMETERS
10 0 10 20
(FOR LEGEND REFER TO MAIN MAP)
110 kV. SUBSTATIONS (City of Brisbane)
1 NUDGEE
2 STAFFORD
3 BUNYAVILLE
4 ASHGROVE WEST
5 MAKERSTON ST.
6 CHARLOTTE ST.
7 VICTORIA PARK
8 NEWSTEAD
9 ROCKLEA
10 WEST DARRA
11 RICHLANDS
12 RUNCORN
WIDE BAY - BURNETT ELECTRICITY BOARD
SOUTH EAST QUEENSLAND ELECTRICITY BOARD
SOUTH WEST QUEENSLAND ELECTRICITY BOARD
MIDDLE RIDGE
TARONG
WIVENHOE
MT. ENGLAND
SOUTH PINE
BULIMBA
TENNYSON
BELMONT
SWANBANK
BRISBANE
SOUTHPORT
BURLEIGH
SURFERS PARADISE
BROADBEACH
MUDGEERABA
TERRANORA
New South Wales
Moreton Bay
Pacific Ocean


QUEENSLAND
ELECTRICITY SUPPLY SYSTEM
AS INSTALLED 30th. JUNE 1985.
SCALE IN KILOMETRES
100 0 100 200 300 400
LEGEND
POWER STATIONS
STEAM
STEAM UNDER CONSTRUCTION
HYDROELECTRIC
HYDROELECTRIC UNDER CONSTRUCTION
GAS TURBINE
INTERNAL COMBUSTION
STANDBY PLANT (INTERNAL COMBUSTION)
GENERATING PLANT OWNED BY OTHERS
TRANSMISSION NETWORK
LINES
275 000 VOLTS
132 000 VOLTS
110 000 VOLTS
66 000 VOLTS
33 000 VOLTS AND UNDER
SUBSTATIONS
GENERAL SYMBOLS
QUEENSLAND STATE BORDERS
ELECTRICITY BOARD BOUNDARIES
RETICULATED AREAS
SELECTED TOWNS AND LOCALITIES
Broken Lines Indicate Transmission Works under construction.
Prepared in the Distribution Co-ordination Department Queensland Electricity Commission.
F.N.Q.E.B.
N.Q.E.B.
C.E.B.
S.W.Q.E.B.
S.E.Q.E.B.
W.B.-B.E.B.
M.E.B.
Gulf of Carpentaria
Northern Territory
South Australia
New South Wales
Pacific Ocean

Generation Development Division

Generation design

The Department continued administering new capital works at completed power stations as well as the operations of Architectural Section.

Greater efficiency in engineering activities was achieved through introducing computer-aided design and drafting. Further applications of this technique and computerisation generally were being pursued.

Through initiatives of the Quality Assurance Section, it is felt that other electricity authorities and suppliers to the Commission are achieving a wider appreciation of the economical advantages of ensuring all parties to any contract adhere to the standard of quality specified or generally expected.

Capital works at existing power stations

At Gladstone Power Station, introducing alternative coals caused an increase in the amount of ash for disposal. This necessitated major modifications to the ash-handling system at a cost of more than $7 M. These include enlarged ash hopper gates at the boiler discharge, new ash crushers, an improved sluicing system, enlargement of the ash storage area and extended pipelines.

A power plant simulator to be used in training operators for Central Queensland power stations was purchased for installation at Gladstone. A new building, complementing the rearranged roadworks and entry to the power station, was designed. Completion of the training building and installation and commissioning of the simulator are scheduled for March 1986 at a total cost of $3.5 M. The workshop and store was extended at a cost of $2 M.

The sulphur trioxide flue gas conditioning installation which improves electrostatic precipitator performance was upgraded to reduce dust emission further and enhance compliance with clean air requirements.

At Swanbank Power Station, investigations to establish the most cost-effective method of reducing dust emission to meet clean air requirements led to work being undertaken to improve the performance of electrostatic precipitators.

Major renovation of internal timbers of A and B station cooling towers was proceeding, the administration building and car park were extended and all internal roads were resurfaced.

At Callide A and Collinsville power stations, investigations were proceeding into increasing the capacity of ash storage areas.

Callide A chimneys were inspected inside and out and minor repairs carried out to ensure their maximum long-term reliability. Similar inspections were scheduled for Collinsville and Swanbank chimneys.

Scientific and engineering services

The Commission carried out investigations and surveys as necessary to ensure any environmental effects of its activities were minimised in accordance with prevailing community standards. Results of the studies allowed cost-effective action to reduce environmental effects. Such measures related primarily to power station design, construction and operation and to associated transmission and substation developments.

To co-ordinate and oversee environmental matters affecting the Commission's operation and implementation of required remedial measures, a Water and Air Pollution Control Committee comprising senior management was established. The committee met several times and provided the direction needed in such a large organisation.

The Callide B Power Station Environmental Impact Assessment demonstrated a need for a detailed land-use survey of farming areas within the Callide Creek catchment downstream from the station site. The Commission's investigations scientists mapped the land use and types of crops or pasture grown and undertook an extensive sampling survey of existing groundwater quality. These baseline data provided standards against which any perceived effects of the station can be assessed.

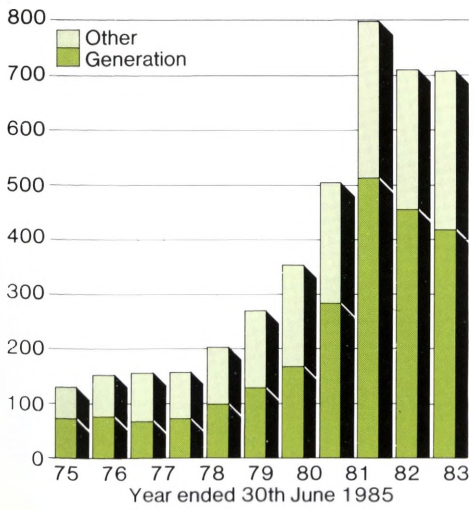
A preliminary Environmental Impact Assessment for Stanwell Power Station project was prepared on the basis of extensive scientific studies and released in October to government agencies and interested public organisations. Responses from these bodies were analysed and indicated no major environmental effects were expected from development of the station. Where potential minor effects were indicated, the Commission's design engineers and consultant scientists were carrying out further studies to determine whether these effects could be minimised economically. A final Environmental Impact Assessment incorporating the results of continuing and follow-up studies was scheduled for release in August 1985.

A data base used to assist power station design was added to and further monitoring carried out to aid later assessment of what possible effects power station operations might have on local conditions.

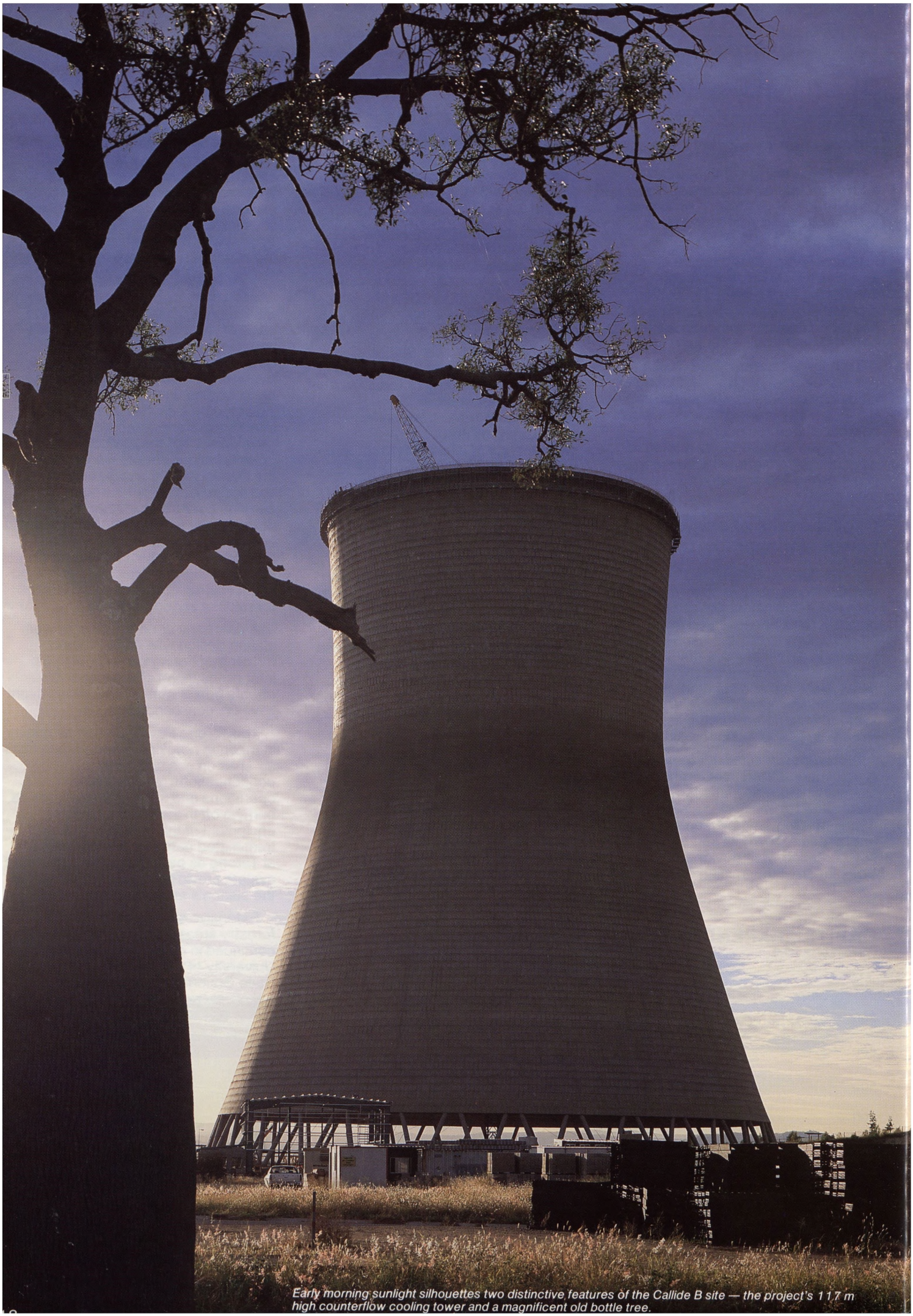
The Tarong Power Station air quality monitoring network provided data from six sites on gas and dust concentrations resulting from operations and such other sources as burning off in the region. Sensing equipment at the monitoring sites transmitted data to a central computer at Tarong as part of a highly automated system providing rapid assessment of the station's emission performance.

Extensive studies on crop and forestry areas surrounding the station continued in conjunction with the University of Queensland and several State Government departments.

CAPITAL EXPENDITURE
(Millions of dollars)



A radiosonde being released during an atmospheric gas reaction study at Gladstone.



Early morning sunlight silhouettes two distinctive features of the Callide B site — the project's 117 m high counterflow cooling tower and a magnificent old bottle tree.

These studies provided important background data on land use and chemical concentrations in vegetation and soil samples.

The air monitoring network surrounding Gladstone Power Station continued providing data on ground-level gas and dust concentrations, which generally were well below accepted environmental protection standards.

The Commission undertook an extensive gas reaction study in July to determine the rate at which nitric oxide (a harmless gas created when coal is burned in power station furnaces) was converted in the atmosphere into the potentially more-potent pollutant, nitrogen dioxide. The Commission, the Queensland Institute of Technology and the CSIRO took part in the study which used the CSIRO's Fokker F27 aircraft, equipped with sensitive analytical equipment, to fly through the power station plume. The study showed the conversion rate was much slower than had been assumed in recent power station design studies and that levels of nitrogen dioxide due to power station operation would have been less than those created by Gladstone's street traffic.

Other studies at Gladstone over several years measured the water temperature effects in the Calliope River from warm water discharged from the station's cooling water system, which uses a once-through flow of sea water drawn from Auckland Inlet. A report was expected to be completed early next financial year. Preliminary conclusions were that Gladstone Power Station had had less effect on the water temperature than predicted when designs were being formulated, with important implications for the design of future coastal stations.

Commission scientists, the University of Queensland and a private consultant have completed field work of a 10 year study of biological effects of warm water release at Gladstone and a final report was being prepared. The study concluded that no measurable effects on local estuary life could be attributed to the power station. As part of the study, more than 1 000 different types of marine life were collected. These specimens were handed over to specialist museums throughout Australia to enhance their reference collections.

Tarong Project

The second of Tarong Power Station's 350 MW generating units went into commercial operation in May. Synchronisation with the State's interconnected system was first achieved on 11 February, with full output attained on 14 March. In subsequent operation under test conditions, this unit supplied electricity to the grid while its conformity with guarantee requirements was verified.

Advanced commercial load dates of February and November 1986 for the remaining two units will be achieved. No 3 boiler was fired for the first time in April as part of the commissioning programme for the third 350 MW unit, No 4 boiler met its April target for hydrostatic testing and all major plant deliveries were completed.

By 30 June, expenditure on the station remained within the revised budgeted cost (after acceleration of the construction programme) and had reached about 84 per cent of the estimated final cost at 1984 prices of $1 220 M. Total personnel on site associated with construction gradually reduced from 1 300 to 1 100 over the year.

Environmental monitoring studies continued using information from both land and satellite facilities. Two Commission scientists explained to representatives at the South Burnett Local Authorities Association annual meeting what air monitoring and crop and forestry studies were being undertaken.

Discussions were held with Kingaroy, Nanango and Rosalie shire councils with a view to finalising infrastructure packages to offset additional costs attributed to the power station development. By June, the Commission had built 231 houses and 26 single persons' units in Kingaroy, Nanango and Yarraman to meet employees' housing needs.

Community interest in Tarong Power Station was demonstrated once again when 9 000 people attended the sixth open day on 20 April.

Callide B Project

Site activities continued on or ahead of schedule with completion of work on the turbine house and annexe cladding, civil engineering work for the coal-handling plant and supply of cooling water pipes.

Major contracts for mechanical plant foundations, miscellaneous buildings, cooling tower and chimney were proceeding satisfactorily with both the cooling tower and chimney reaching full height during the period.

Boiler No 1 erection continued ahead of schedule with drum lift being achieved on 1 May and early access being granted for erection of No 2 boiler structural steel.

Twenty contracts worth $33 M were awarded, the major areas being miscellaneous buildings, fire fighting

Tarong Power Station reached half its final capacity on 1 May, just weeks after the No 3 boiler was fired for the first time and the No 4 boiler had passed its hydrostatic tests.

plant, miscellaneous pipework, cabling, switchgear and transformers. At 30 June, the only major contracts remaining were for the ash dam, workshops, administration building and make-up water system.

Work was continuing on infrastructure, including the Thangool/ Biloela Road, town sporting complex and Awoonga/Callide pipeline. Work on the sewage treatment and water treatment plants was completed.

The contractors' workforce reached 400 and was expected to rise to 800 by the end of 1985. Since the project started, 82 houses and flats have been constructed or purchased, with another 33 houses and 10 flats planned for construction by early 1986. Further housing construction would be governed by the long-term requirement for accommodating operations staff in Biloela.

The 220 unit Archer Single Men's Accommodation was completed in October, doubling the amount of accommodation available for single men. Work continued on the 150 unit second stage of the Valentines Plain Road Family Hostel, the completion of which will bring to 420 the number of married accommodation units available for the construction workforce.

Environmental activities at the site included a tree-planting programme involving mainly species native to the area, including bottle trees, red iron bark and callistemon (bottle brush). Erosion-prone areas of the site were grassed to prevent damage.

Stanwell Project

A flexible construction programme continued to be maintained for the 1 400 MW Stanwell Power Station, allowing for the first generation of electricity to be achieved in the early 1990s.Total expenditure on the project to 30 June amounted to $47 M of a total expected cost of $1 470 M at 1984 prices.

Design work on foundations, structural steel, rail and water supply proceeded to programme, with detail design of boilers and turbines well advanced. Comments from statutory bodies on the preliminary Environmental Impact Assessment Report will be incorporated in the final edit of the document to be issued in August 1985.

The contractors' workforce on site during the year peaked at 109 and averaged 59.

Contracts for site earthworks and the main access intersection were completed and others for the sewage treatment and construction water treatment plants, let early in 1985, were proceeding to programme. The contract for bored piles associated with the major foundations was awarded in May.

Concern by the Commission to eradicate noxious weeds on site led to the award of a $114 000 contract under which work was progressing satisfactorily to clear rubber vine infestation.

A contract was awarded for the major dams site investigation and tenders for phase one of the foundations for turbine house columns and auxiliary bay buildings were due to be called later in 1985.

An infrastructure package of about $1.2 M was approved as a contribution to the Fitzroy Shire Council to defray costs associated with the station's impact on Gracemere township. Work already completed and partially funded under this package included construction of the Gracemere sewerage scheme, a new community hall and purchase of a 30.4 ha land parcel for use as a future recreational facility. Preliminary discussions have been held with Rockhampton City Council on their submission requesting an infrastructure contribution. Discussions with the Main Roads Department are well advanced.

Stanwell Power Station site earthworks completed during the year provide for the switchyard (foreground), main power station platform (centre) and coal stockpile (rear left), as well as other facilities.

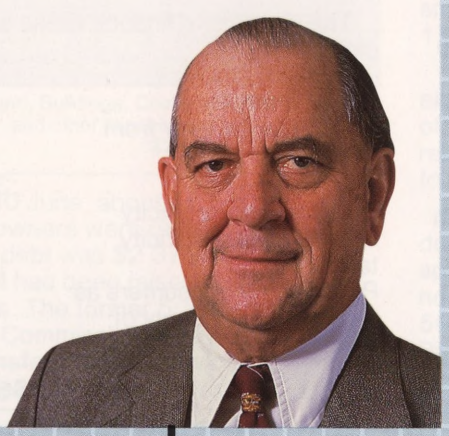
Finance and Administration Division

This Division, headed by the Secretary, consists of three Departments — Finance, General Services and Administration.

KEITH DESMOND VIERTEL, B.Com., A.A.U.Q., Secretary; formerly Deputy State Electricity Commissioner (Administration) from May 1970; born and educated in Brisbane and a graduate of the University of Queensland.

Since joining the State Public Service in 1943, Mr Viertel has served in several Government departments.

He joined the former State Electricity Commission of Queensland in 1961 as Internal Auditor and later spent a period as an officer of the then Treasury Computer Centre prior to his appointment as Secretary to S.E.C.Q. in 1966.



FINANCE DEPARTMENT

Commission and industry budgeting and financial forecasting;

Financial accounting and costing;

Formulating tariffs and special agreements for the supply of electricity;

Loan raising and maintaining an Inscribed Stock Registry.

GENERAL SERVICES DEPARTMENT

Managing and developing EDP facilities and overseeing purchase of other data processing equipment;

Internal organisational consultancy;

Property, including provision of employee housing;

Internal auditing.

ADMINISTRATION DEPARTMENT

Providing office services;

Maintaining clerical standards;

Controlling head office building and associated services including canteen;

Arranging and administering Commission's insurances;

Providing internal legal services;

Making statutory appointments and providing statutory approvals.

Finance Department

Operating results

Commission

The total moneys received by the Commission from its operations in 1984/85 comprising receipts from bulk electricity sales, interest on temporarily-surplus funds, statutory fees and other miscellaneous sources totalled $706.8 M.

Operating expenditure totalled $706.2 M.

There was a surplus of $15.4 M carried forward from 1983/84 and an end-of-year surplus of $16.0 M.

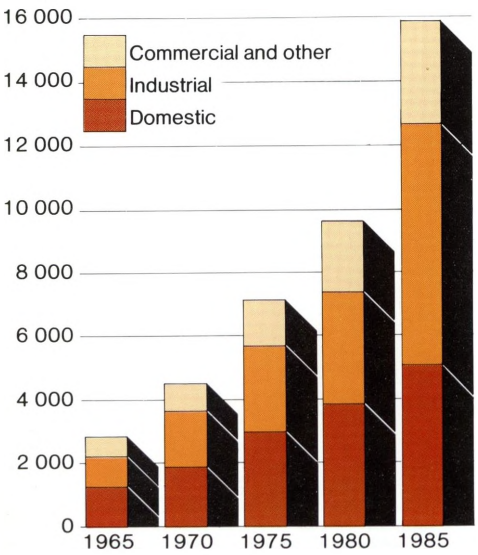
Electricity supply industry

Full details of the financial operations of the Commission and the Electricity Boards will be provided to Parliament in the Financial Report of the Electricity Supply Industry which will be tabled when audited accounts are available.

However, the financial situation with respect to operations in 1984/85 was:

- Total moneys available to meet operating costs was $1 199.2 M, including carryovers from the previous year;
- $1 096.3 M, 91.4 per cent of the above amount, was receipts from the sale of electricity;
- receipts from the sale of electricity increased 16.6 per cent over those for the previous year, about 10 per cent coming from tariff increases and the balance from load growth;
- payments of operating expenses totalled $1 176.5 M;
- the net surplus of $22.7 M was about 1.9 per cent of total receipts.

SALES OF ELECTRICITY (GWh)



Capital expenditure

Commission

During 1984/85, the Commission spent $488 M on capital works which comprised:

$390 M on new power station projects,

$108 M on works on existing power stations and expansion and reinforcement of the main transmission system,

$10 M credit on miscellaneous works (buildings, mobile equipment and the like, including a credit of $26 M on fuel stocks).

The moneys to finance these works came from:

	A$ M
Funds carried over from 1983/84	59
New borrowings	383
Provided by Electricity Boards from electricity tariffs	106
Provided by consumers as a condition of supply of electricity	8
	$556 M

Electricity supply industry

The total expenditure of new capital works in 1984/85 was $675 M. The principal sources of funds were:

	A$ M
Capital works component of electricity tariffs	225
New loan moneys	402
	$627 M

Loan raising

As a result of a slow-down in capital works expenditure, it was possible to reduce raisings under the approved loan programme by almost $114 M.

The approved loan programme for 1984/85 consisted of:

	A$ M
Raised by the Commission	
For new capital works	438
For conversion of maturing loans	159
Raised by Electricity Boards	
For new capital works	14
TOTAL	$611 M

Of the amount required, $275 M was raised overseas and $222 M in Australia.

The borrowings comprised:

	A$ M
Commission raisings	
Public loans	58
Private loans	46
Private loans issued by tender	104
Overseas loans	275
Direct raisings by Electricity Boards	
Private loans	14
Not raised and referred back to Treasury for reallocation	114
TOTAL	$611 M

Overseas borrowings of A$275 M included:

Two Euro-Dollar Note Issues	$US 110 M
A Euro-Dollar Bond Issue	$US 100 M
A Swiss Franc Bond Issue	Sw Fr 100 M

Proceeds from the first Euro-Dollar Note Issue were allocated partly to the 1983/84 loan programme (A$50 M) and partly to the1984/85 programme (A$22 M).

The three bond issues were raised by The Queensland Government Development Authority. Total A$ proceeds of the first Euro-Dollar Bond Issue and the Swiss Franc Bond Issue were made available to the Commission. The second Euro-Dollar Bond Issue had not been drawn down at 30 June but A$10 M will be provided to the Commission to bring the total Australian dollar receipts from overseas to A$275 M.

An amount of $58 M on account of the 1985/86 loan programme was raised during 1984/85 by way of:

	A$ M
Public loan 106	1
Public loan 107	12
Private loans	45
TOTAL	$58 M

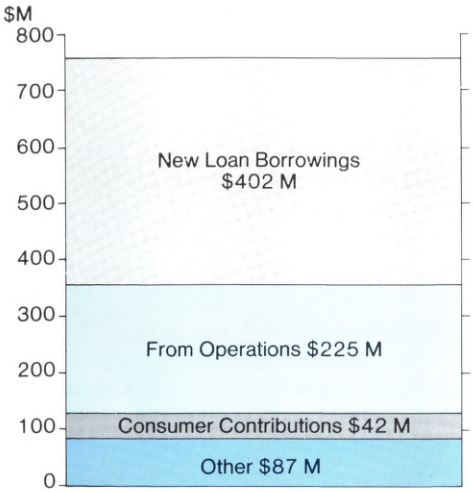
This amount was applied to conversion of loans maturing up to 1 September 1985.

At 30 June, total loan indebtedness of the Commission was:

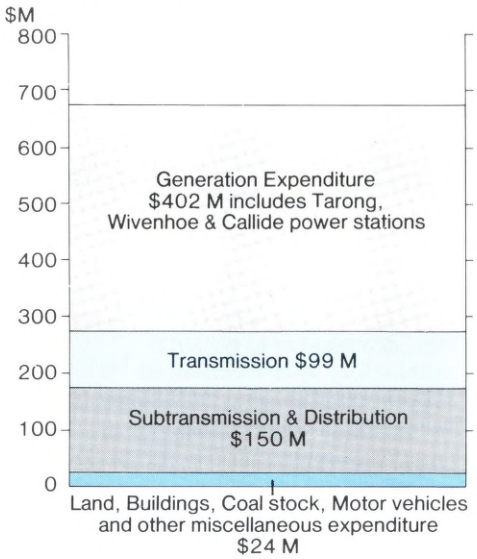
	A$ M
From domestic sources	2 275
From overseas sources	825
TOTAL	$3 100 M

On 1 July, the long-term private loan rate payable by the Commission was 14.0 per cent. By 23 August, this rate had fallen to 12.8 per cent but, in November, the trend turned upwards and, by 30 June, long-term rates had returned to the 14.0 per cent level.

CAPITAL WORKS RECEIPTS $756 Million



CAPITAL WORKS EXPENDITURE $675 Million



Weakness of the Australian Dollar against most other international currencies caused serious concern during the year. At 30 June, approximately A$825 M had been drawn down from overseas and, if all loans had been repayable on that date, the cost of redemption would have been of the order of A$1 044 M. As these loans are repayable over an extended period and interest rates are lower than on the domestic market, these figures should be regarded only as present-day indication of costs. Real costs will be established only when principal is repaid.

A foreign exchange reserve which amounted to A$47 M at 1 July 1984 had been accumulated to help meet foreign currency adjustments.

It has been able to absorb all exchange fluctuations in the worst period yet for the Australian Dollar in the world's currency markets and, at 30 June, was still in credit to the extent of $35 M. Provided the Australian Dollar stabilizes at about the level prevailing at 30 June, the policy adopted to spread the cost of exchange fluctuations over the term of the debt will have been effective.

Moneys not immediately required by the industry were invested by the Commission and earned interest in 1984/85 of $38 M. This was brought to account in the Commission's books or paid to the Electricity Board which provided the funds for investment.

Registry of Inscribed Stock

The Commission's Registry of Inscribed Stock in Brisbane managed all the domestic debt of the Commission and the Electricity Boards.

At 30 June, about 46 500 stockowners were registered. The gross debt was $2 373 M of which $77 M had been raised by Electricity Boards. The former branch registries of the Commission have been replaced by transfer marking services in Sydney and Melbourne.

Recently-developed on-line computer systems using the Commission's own computers enabled fast and efficient service to be available for all stockholders.

Electricity tariffs

Tariff determinations made on 16 June 1984 formed the basis of charging for most electricity consumed in Queensland in 1984/85. The effects of these tariff determinations were to increase the bulk supply charges paid by the Electricity Boards to the Generating Board by approximately 12.5 per cent from 1 July 1984 and to increase retail tariffs by an average of 9.7 per cent from 15 June 1984.

Following a review of the financial situation and taking forecast costs for 1985/86 into account, tariff increases of 9.5 per cent for bulk supply and 6.3 per cent in retail tariffs were approved for the 1985/86 financial year. The increased bulk supply charges will apply from 1 July 1985 and the new levels of retail tariffs from 15 June 1985.

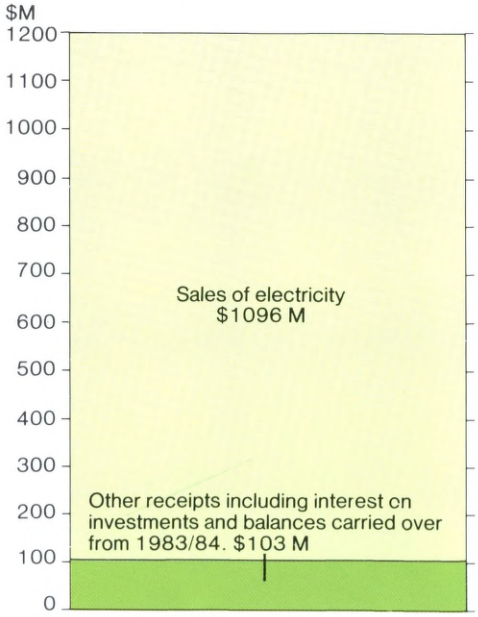
Since reorganisation of the electricity supply industry, the number of different tariffs levels has been reduced from about 180 in July 1977 to only 31 by mid-June 1985.

In July 1977, charges under the domestic lighting and power tariffs applicable in cities of central and northern Queensland were about 50 per cent higher than charges in Brisbane, with margins of up to 150 per cent in more-isolated areas. Subsequent movements towards uniformity reduced the margins and, from the start of 1985/86, domestic tariff uniformity existed throughout the State.

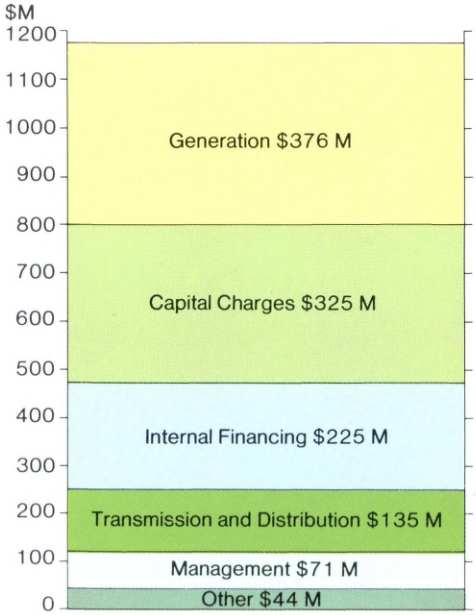
Further tariff initiatives taken have had effect in the following areas:

- controlled water heating tariffs are to be introduced progressively in all areas of electricity supply with the continuous water heating tariff being

OPERATING FUND RECEIPTS $1199 Million



OPERATING FUND DISBURSEMENTS $1176 Million



phased out when the controlled tariff becomes available;

- small general supply consumers (churches, charities, small businesses, etc) are seeing reduced charges in accordance with the policy of reducing the undesirably high charges to small consumers on this tariff;
- the general supply tariff is to be made uniform throughout the State from 1985/86;
- a general supply time-of-day tariff will be introduced from 1985/86; and
- farm consumers will be given the option of taking supply under a time-of-day tariff offering lower rates in the daytime periods at weekends.

Insurance, legal services and statutory functions

Insurance

The Commission continued actively managing its insurance programme. Its brokers, Sedgwick Limited, were reappointed.

Mr R. M. Bieber of Ebasco Risk Management Consultants Inc., New York, was engaged to review the insurance and risk management practices of the electricity supply industry in Queensland and, specifically, to assess the sufficiency and scope of the Commission's insurance programme. His findings were that the Commission's insurance arrangements overall were soundly based.

A concept promoted by Mr Bieber was establishment of a self-insurance pool encompassing the seven Electricity Boards. A joint investigation by the Commission and the Boards was proceeding into all aspects of this matter including simply the carrying of a greater part of the total risk.

Although there was continued improvement of the Commission's ability to contain losses (particularly in the property damage and replacement energy areas) and experience was enabling it to accept more of its own risks, the Commission was adversely affected by contraction of the international reinsurance market following the disastrous 1983 bushfires in Victoria and South Australia. The greatest reluctance to accept Australian risks occurred in general liability cover. However, it is hoped that accepting a substantial deductible for bushfire risk will enable the Commission to obtain a satisfactory level of cover at acceptable though substantially increased premium rates.

Legal services

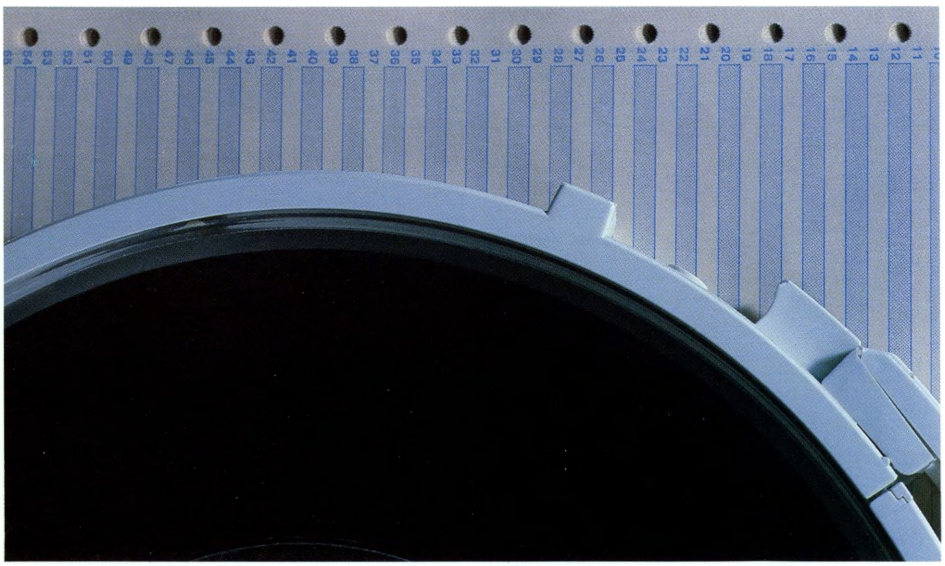
The Commission's two legal officers (both qualified solicitors) continued providing legal opinions and advice on all aspects of Commission activities.

The Solicitor-General of Queensland as the Commission's official legal advisor provided the outside legal advice sought by the Commission and conducts any litigation in which it becomes involved.

Statutory functions

Statutory appointments and other statutory functions the Commission was required to exercise but which did not necessitate establishment of separate and expert sections were dealt with under the supervision of the Co-ordinator of Insurance and Legal Services.

During the year, the various Electricity Boards were reconstituted following the triennial local authority elections, the Electricity Act was amended and the Electricity Regulations revised consequent on amendment of the Act and a full review of the existing Regulations.



Computer services

The growth in demand for computer facilities was met by increases in the number and power of the Commission's computers. By 30 June, there were two ICL dual 2988 computers, the second machine having been upgraded from a single 2988 configuration during the year.

There was considerable expansion in the use of computer-aided drafting and in the number of microprocessors as well as terminals connected to the central computers.

The use of small computers for suitable applications was expanded with benefit to the organisation while providing greater satisfaction to the users.

Major new systems brought into production included:

- Power Station Information System being used by Tarong personnel in support of plant performance and maintenance management;
- Transmission Division began using the Materials Reservation System to ensure supplies necessary to support projects were available at the required time;
- Stock Registry System for management of electricity industry loans and indebtedness; and
- Ledger Accounting and Financial Information System was installed in Finance Department to allow comprehensive computer processing of the Commission's financial information.

Initiatives to support the communications requirements of the QEC computing network included new technology for data communications in the new head office and participation in Queensland Government studies to determine the optimum mix of terrestrial and satellite media to satisfy requirements through the next decade.

Property management

Purchase of four sites for future coastal power stations is proceeding and should be completed within 12 months. As none of the sites will be used by the Commission for power station purposes in the near future, the land will be leased, mainly for farming or grazing purposes, with priority being given to the former owners where practicable.

Administration Department

An important function of Property Management was provision of employee housing. During the year, 128 dwelling sites were acquired, 21 houses purchased and 97 dwelling units erected, including first-class single staff accommodation at Kingaroy, Nanango and Collinsville.

In Biloela, the Land Administration Commission is arranging a subdivision, to be financed initially by QEC, which will provide housing sites for QEC employees and others attracted to the town by the Callide B project. A number of sites will be reserved for use by the Queensland Housing Commission.

Discussions were held with unions concerning a possible home purchase assistance scheme, limited to power station employees.

Considerable uniformity was achieved in conditions of employees' occupancy of Commission dwellings. However, due regard was given to the need for the Commission to provide accommodation because of the housing situation in those localities where power stations are sited. It is expected that the close proximity of Stanwell Power Station to Rockhampton will minimise the need for subsidised accommodation for employees at that location.

Internal audit

The Commission's Internal Audit Section undertook wide ranging financial, operational and management audit tasks during the year.

Scheduled visits were undertaken to administrative and operational field locations and the section continued to provide an internal audit service for the Mackay and Wide Bay-Burnett Boards as well as specialised advice on computer audit matters to other Electricity Boards on request.

Liaison was maintained with Auditor-General's Department staff in the completion of a programme of financial audit.

Internal consultancy

In line with the group's function of productivity improvement, matters relating to office automation and communication received particular attention to ensure the installation of adequate facilities in the new head office building.

As well as several projects internal to the Commission, work was undertaken for Electricity Boards.

An important and continuing role ensured the office equipment being purchased is appropriate to and adequate for the task for which it is intended. Forms design and standardisation was another role being fulfilled.

The group's staff were responsible for the organisation and running of the ESAA Productivity Improvement and Work Study Appreciation Course No 19 in June.

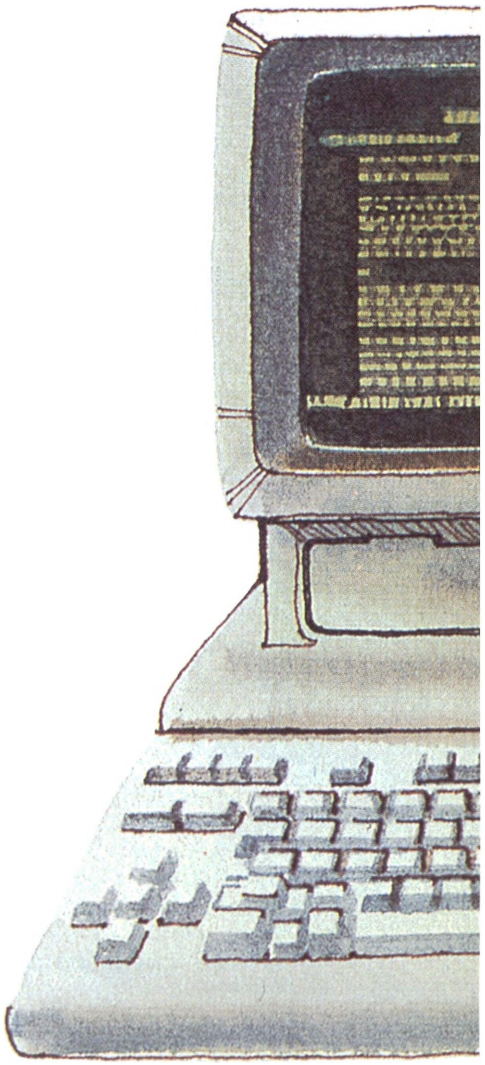
Administrative services

Word processor acquisitions stablilised after the significant expansion in facilities of previous years. Developmental emphasis was placed on establishing text communications between word processing and the ICL mainframe computer.

Progress continued on the development of a computer-supported document management system, with completion of the file classification system and development of a file movement system.

During the year, approval was given for the merger of the libraries of the Queensland Electricity Commission and The South East Queensland Electricity Board.

Houses recently completed in Biloela have incorporated variations meant to reduce the sameness in housing erected under the Commission's housing system; this artist's impression shows one of the new homes.



Employee Relations Division

The separate functions of the Employee Relations Division — personnel administration, manpower planning, industrial relations — complement one another in providing services to the Commission as an employer, in helping employees to understand employment conditions and in resolving any difficulties arising from such employment.

CLIFFORD WILMOT FARMER, B.E., Manager Employee Relations since April 1985; born and educated in Brisbane.

An electrical engineer, Mr Farmer began his career with the electricity industry in 1959 when he joined the staff of The Southern Electric Authority of Queensland.

Before he left SEAQ in 1971, he had been involved in transmission planning and project co-ordination.

He became Managing Director of the Harley Group of Companies and, in 1977, left to become a partner in an engineering consultancy. In 1982, Mr Farmer formed his own consultancy which he operated until joining QEC.

PERSONNEL DEPARTMENT

Staff recruitment, salary administration, staff records;

Staff development, including internal and external training;

Occupational health, safety and welfare;

Manpower planning.

INDUSTRIAL RELATIONS DEPARTMENT

Helping develop industrial relations policy;

Conducting negotiations with representatives of employees;

Observing, enforcing awards and agreements;

Providing advocacy before industrial tribunals;

Monitoring industrial trends within and outside the industry.

Personnel Department

Staff numbers decreased by 58, a fall of 1.1 per cent. For the past four financial years, staff numbers have varied by:

Year	Percentage	
1981/82	+ 17.2	(QEGB)
1982/83	+ 7.8	(QEGB)
1983/84	+ 4.8	(QEGB)
1984/85	– 1.1	(QEC)

The Commission's total staff at 30 June was 5 187, made up as shown in the accompanying diagram.

There was a slight increase, to 4.8 per cent, in the rate of staff turnover; this figure compared with a 3.7 per cent turnover rate in 1983/84.

Redeployment of staff no longer needed for Tarong Power Station construction and the finding of positions for graduate engineers, apprentices and other trainees completing their training required special efforts in the climate of a stable workforce coupled with a reduced rate of growth in demand for electricity.

The function of manpower planning, responsibility for which has been accepted by the Division, will be carried out in future by Personnel Department.

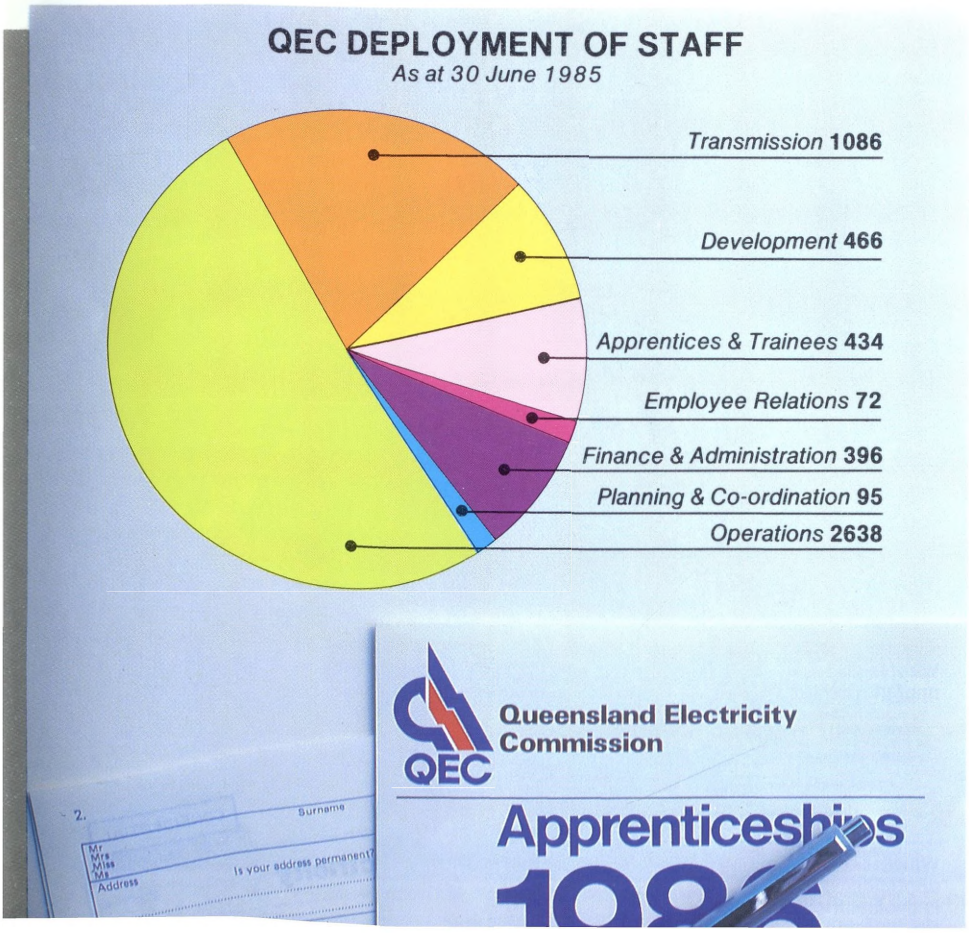
More than 100 classification assessments were undertaken during the year.

Internal staff development activities attracted more emphasis and 235 employees attended various external staff development activities compared with 506 in 1983/84.

A total of 370 employees was receiving assistance with studies directed at obtaining academic qualifications relevant to their careers with the Commission.

Technical Training Group activities concentrated on technical training policy, instructional systems design, assessment of training needs and the evaluation and quality control of training programmes both internal and external. Administration of a number of technical training schemes became the responsibility of the appropriate engineering divisions.

Occupational health staff undertook several tasks additional to their normal ones of providing health services to Commission employees. Among these were a medical monitoring programme on 396 employees who had been exposed to asbestos at some time and much effort to try to overcome problems associated with the use of screen-based equipment. Appropriate administrative procedures were implemented in an effort to minimise any risks involved in sustained use of such equipment.



Industrial Relations Department

Industrial disruption and subsequent legislation and legal proceedings

The year was rendered exceptional through unprecedented industrial turmoil — particularly the February strikes by electricity supply industry employees, the open confrontation between State Government and unions and the Government measures which followed.

Catalyst for the industrial confrontation was a dispute which had existed for some months before February between the Electrical Trades Union and The South East Queensland Electricity Board. This dispute led to a strike on 3 December. State Industrial Commission orders achieved a return to work on 7 December but, following further negotiations, another strike occurred on 17 January. The Industrial Commission successfully ordered the men to return to work on 18 January after a severe storm had caused much damage in and around Brisbane.

Disputation continued until 6 February, when an indefinite strike was called. An order issued on 7 February for the striking men to return to work at 4 pm was not obeyed. The same day, a State of Emergency effective for one month was proclaimed under the Transport Act 1938-1981.

Acting in accordance with the Order-in-Council under which the State of Emergency was declared, The South East Queensland Electricity Board advised its employees that those who did not resume duty would be dismissed. Dismissals followed, strikes occurred throughout the electricity supply industry and power station operators reduced output from generators without authority.

Queensland electricity consumers were seriously inconvenienced and the monetary losses to Queensland and Queenslanders were enormous.

Other unions initiated strikes to support the dismissed employees and some industrial action continued well after electricity supply returned to normal in early March.

The Government, The South East Queensland Electricity Board and other electricity authorities used the available processes of civil law in an effort to overcome the disruption caused by the industrial actions.

As a consequence to the disruption, Parliament passed a series of Bills designed to ensure that the continuity of electricity supply in future would not be affected by strike action. The

legislation introduced by the Minister for Mines and Energy comprised :

Electricity (Continuity of Supply) Act 1985 and an amendment to this Act;
Electricity Authorities Industrial Causes Act 1985.

The Government also strengthened the provisions of the Industrial Conciliation and Arbitration Act in a number of ways. The most significant was a widening in the definition of "strike" to include the many sophisticated forms of industrial action embraced by the unions and their members.

The **Electricity (Continuity of Supply) Act** provided for the continued effectiveness of the dismissals made under the Order-in-Council which declared the State of Emergency.

The Act also permitted The South East Queensland Electricity Board to enter into a contract with a person who normally would be covered by the Electrical Engineers Award — State, the contract being in accordance with the terms of that award except in the matter of hours of work which were to be 38 per week with no nine-day fortnight. The preference provisions were to have no effect and a "no-strike" undertaking was to be signed by the employee.

The Act further provided that the State Industrial Commission did not possess jurisdiction to make any decision, recommendation or give any other indication directed to reinstatement or reemployment of the dismissed employees. The Amendment Act gave police the power to arrest without warrant any persons considered to be obstructing or harassing industry employees.

The **Electricity Authorities Industrial Causes Act** removed electricity supply industry employees (except apprentices) from the jurisdiction of the State Industrial Commission and the Industrial Court and placed them under the jurisdiction of an Electricity Authorities Industrial Causes Tribunal.

The new Act set out certain principles for the guidance of the Tribunal in the exercise of its jurisdiction but provided that, subject to these principles and any prescriptions to the contrary made by Regulation under the Act, the practice and procedure of the Tribunal would be governed by the provisions of the Industrial Conciliation and Arbitration Act 1961-1985 and of the rules thereunder governing the practice and procedure of the Industrial Commission.

Provision was made for advisory panels to assist the Tribunal in its deliberations.

Preference to members of an industrial union in an electricity calling was cancelled. The Tribunal does not have the power to restore it.

His Honour, Mr District Court Judge Eric Pratt, Q.C., was appointed to first constitute the Tribunal.

In moves designed to counter the new legislation, several unions served logs of claims on the Queensland Electricity Commission and the Electricity Boards seeking awards under the Australian Conciliation and Arbitration Commission.

Findings of disputes were made in respect of logs of claims by the Electrical Trades Union and the Municipal Officers Association. Logs of claims by other unions either proceeded to preliminary hearing or were held in abeyance.

An appeal by employers to a Full Bench of the Australian Conciliation and Arbitration Commission against the finding of a dispute in respect of the Electrical Trades Union log of claims was unsuccessful. This decision was the basis for proceedings before a Full Bench of the High Court of Australia in which Writs of Prohibition were sought against the Australian Conciliation and Arbitration Commission.

In an endeavour to assist the unions to have the hearings of their claims for federal awards expedited, the Federal Government passed legislation titled "Conciliation and Arbitration (Electricity Industry) Act 1985" which was to be specific to Queensland and effective for a maximum period of three years. It referred the claims for federal awards by the Electrical Trades Union to a Full Bench of the Federal Commission with no provision for appeals.

The Queensland Government challenged the legislation on constitutional grounds in the High Court.

These events were unprecedented not only in the electricity supply industry but in Australia generally.

National wage flow-on

On 19 April, a Full Bench of the State Industrial Commission flowed into Queensland awards and industrial agreements the national wage increase of 2.6 per cent with effect from 15 April.

The increase flowed into industry awards as the State Industrial Commission at the time still was vested with jurisdiction to deal with industry matters.

Time lost through industrial disputes

Total time lost in Queensland Electricity Commission operations amounted to 12 710 mandays, of which 9 938 mandays were lost through Commission employees supporting dismissed former SEQEB employees.

Total time lost by contractors' employees at the various power station construction projects was 31 263 mandays at Tarong and 1 471 mandays at Callide B. There was no loss of time at Stanwell site.

Just over 10 000 mandays were lost by all union groups during negotiations over renewal of the Tarong site agreements. A protracted strike by members of the Electrical Trades Union over their rejection of new terms also contributed to the extensive loss of time. With the exception of the Electrical Trades Union, all unions became signatories to the renegotiated agreement registered with the State Industrial Commission.

The Electrical Trades Union continued to be covered by the less beneficial terms of the earlier agreement. The union later claimed the electrical contracting rates in the Electrical Engineering Award — State, together with the site allowance payable at Tarong. This claim was rejected by the State Industrial Commission (which continues to exercise jurisdiction over contractors' employees) and the union was advised that it may apply to become a party to the Tarong agreement but that no retrospectivity would be allowed.

Numbers employed in electricity supply industry

Total employment in the Queensland electricity supply industry fell to approximately 12 300 positions at 30 June, compared with a level of 13 100 the previous year.

The principal — but not sole — reason for this 6.1 per cent decline was the February industrial disruption. Employee numbers declined across the whole industry in distribution, generation and transmission areas. Approximately 58 per cent of industry staff was employed by the seven Electricity Boards,compared with 60 per cent the previous year.

The South East Queensland Electricity Board

Despite increased pressure resulting from the industrial dispute over the Board's use of private contractors to erect certain capital works projects, services to consumers were maintained at a high level.

The dispute, which resulted in 990 members of the Electrical Trades Union being dismissed, peaked over the December to February period and continued to pressure Board operations to the end of the year. This one dispute accounted for 96.2 per cent of the year's total of 11 277.2 mandays lost through industrial disputes. Nonetheless, 95 per cent of the year's budgeted works were finished with incurred costs equivalent to the works completed, including several major projects being undertaken to help meet South-east Queensland's growing electricity demands.

Work was well advanced on a 110/11 kV substation being built in the basement of a high-rise office building in Brisbane's inner-city area. Just over $12.3 M had been spent on the Charlotte Street project, which was due to have its first transformer in commercial service in July 1985.

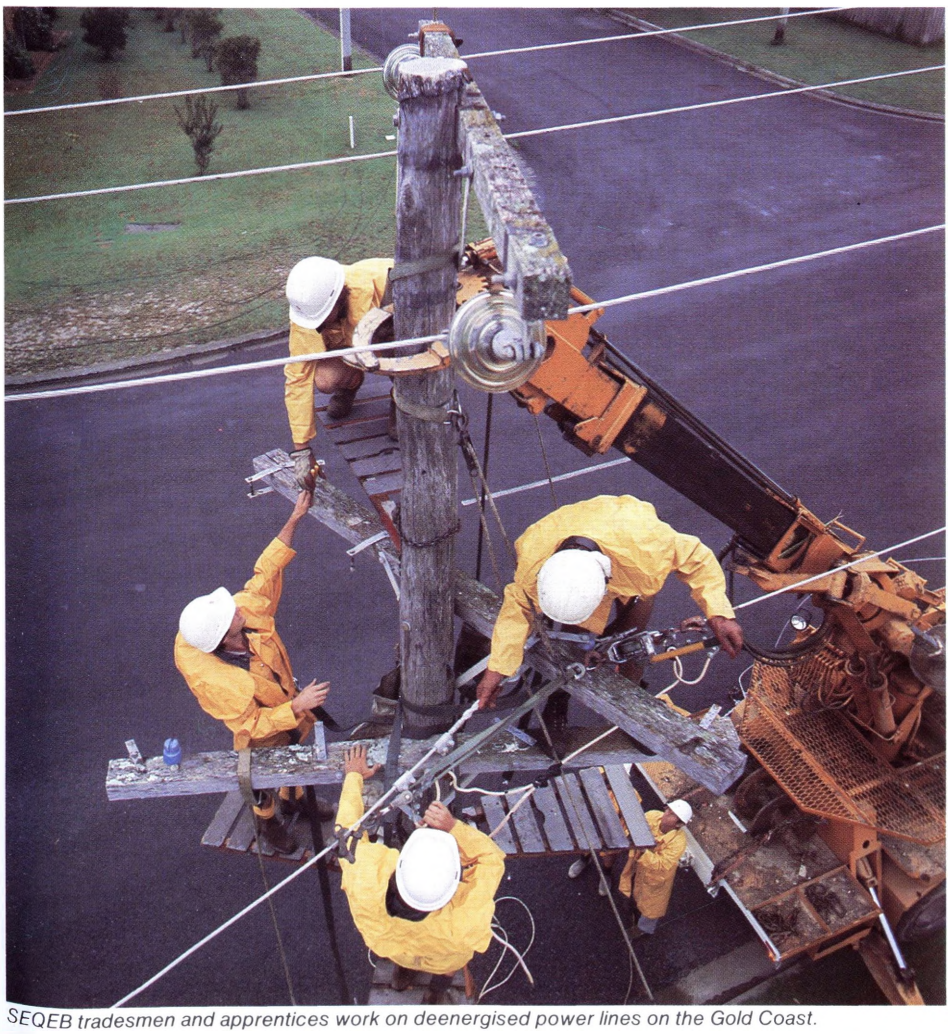
At Broadbeach, on the Gold Coast, a 110/11 kV substation due for completion early in 1985/86 will more than double existing capacity and duplicate supply to Jupiters Casino. Upgrading of circuit capacity at a cost of $0.6 M for the 110 kV overhead feeder between Mudgeeraba and Burleigh substations was progressing well.

Work was continuing on the final stage of $3.5 M supply extensions to the Redland Bay islands of Karragarra, Lamb, McLeay and Perulpa with a 110 kV overhead line being built between Beenleigh and Rocky Point. About $3.5 M of an estimated $4.8 M total had been spent on a new transmission substation at North Springwood to augment capacity on Brisbane's southern outskirts, where consumer growth is among the Board's highest. Increasing load demands will be met by a $1.6 M substation at Redbank to be completed by November 1985 with a 50 MVA capacity at 110/11 kV.

Commissioned were the $6.7 M 15 km Cooroy-Noosaville double circuit 110 kV overhead line and Noosaville 110 kV zone substation and the $2.8 M stage one of Alexandra Headland 132/11 kV substation, which effectively doubled supply capacity in the area. Another project involving installation of a 30 MVA regulator at Stradbroke Island substation will allow expansion of the Consolidated Rutile Ltd sand mining operation on the island. The overhead 33 kV Cleveland-Raby Bay line was completed and supply augmented at Lawnton, Rocklea, Flinders and Booval zone substations at a total cost of $0.9 M.

The Energy Utilisation Centre, formerly located at Windsor, was expanded and relocated to Milton where major consumers will be able to observe on-site demonstrations of energy-efficient electrical equipment. The Advisory Services Group, which had been based at head office, were accommodated at the Energy Utilisation Centre in line with a plan to provide a 'one stop' energy advisory service.

Electricity sales of 6 973 GWh in 1984/85 represented a growth of 4.0 per cent over those of the previous year. This increase was achieved despite substantial supply disruptions during industrial disputes in September, October and February. The economic recovery which started in the latter part of 1983/84 proved to be more sustained than expected and, during the last four months of 1984/85, a growth rate of 6.7 per cent in electricity use was recorded.



SEQEB tradesmen and apprentices work on deenergised power lines on the Gold Coast.

The South West Queensland Electricity Board

Extensions to the Board's head office in Dalby were completed at a cost of $3.0 M and officially opened by the Minister for Mines and Energy, the Honourable Ivan J. Gibbs, M.L.A., on 17 October. The modern, attractive office which now houses staff who had been located in seven buildings provides a major boost to staff morale and productivity.

Planning and design continued on the 66 kV transmission system to supply the St George, Charleville and Cunnamulla areas from the State's interconnected power system. Tenders were called for the first stage of a 66 kV line between Charleville and Wyandra, due for completion by winter 1986. Close liaison was maintained

with the Queensland Electricity Commission, which is responsible for the project to make supply available to Roma in April 1986.

Additional generating plant was installed at Charleville and Thargomindah at a total cost of $0.3 M. A 790 kW set from Roma was shifted to Charleville to provide the necessary generating capacity to meet load growth in the combined Charleville/Cunnamulla areas until transmitted supply becomes available. At Thargomindah, a 100 kW set was installed to meet continuing load growth.

Major substation construction work was undertaken in Toowoomba, Jandowae and Wandoan at a total cost of $0.8 M. Construction of 67 km of 33 kV line from Miles to Wandoan was nearing completion and, with the zone substation being built at Wandoan, will finalise a $1.5 M project to augment supply to Taroom Shire.

There was an above-average demand by prospective consumers for new and additional supplies. Expenditure on this type of work totalled $4.1 M, $0.9 M in excess of the estimate. The work involved a significant requirement for new residential subdivision in and around Toowoomba.

A new depot was officially opened in Dalby on 28 March by the Board's Chairman, Councillor D. C. Sturrock, O.B.E. This new development, completed at a cost of $0.7 M, houses outside staff formerly located at the old Dalby power station and technical staff associated with the Board's Central Division operations.

While the Board's data processing equipment was being shifted to the new head office, the opportunity was taken to upgrade the equipment at a cost of $0.3 M to keep pace with continuing development of accounting and administrative systems.

The number of staff employed by the Board was 555, an increase of only 1.7 per cent over the year, reflecting the Board's ability to contain cost increases by limiting appointment of new and additional staff.

The Wide Bay-Burnett Electricity Board

Economic conditions continued to have a marked effect on the operations of the Board in 1984/85.

Energy sales and receipts from this source were below budget due to the downturn in the rural sector and the consequent decline in commercial and industrial activity. Despite the downturn, energy sales increased by 2.2 per cent to total 470.5 GWh, failing to reach the predicted total of 507.4 GWh.

Receipts were $2.9 M below budget and totalled $45.0 M, representing a 9.9 per cent increase over receipts for 1983/84. A 16.9 per cent increase and receipts of $47.9 M had been anticipated for the year. In addition, industrial disputation during February contributed a further $0.492 M to lost revenue. The number of connections during the year totalled 1550, representing a growth in consumer numbers of 2.7 per cent and bringing to 58 618 the total number of consumers supplied.

The Board continued to meet the demand for electricity and prepared for future load growth with a capital works budget of $13.5 M. Expenditure was allocated for improvements to six substations, construction of three subtransmission lines and several other projects which were commenced for completion in 1985/86.

The Rural Electricity Subsidy Scheme was nearing completion with two major projects finished during the year. Total expenditure on the Eidsvold West and Allies Creek-Monogorilby extensions was $1.4 M, enabling connection of 83 consumers. The last two projects, expected to cost $0.24 M, were started at Thinoomba and Gaeta-Kolonga to connect supply to a further 14 consumers.

In total, almost $3.5 M will have been spent on providing electricity to groups of consumers previously not connected to transmitted supply. A total of 990 km of line will have been erected for electricity reticulation to 226 consumers connected under the scheme.

The installation of load control relays continues to offer a growing number of consumers the benefits of controlled water heating tariffs. Eighty three per cent of hot water systems within the Board's area are being supplied under these tariffs following the installation of further relays during the year.

Construction of a new administration centre in Maryborough started in September and the three-level building is expected to be occupied by administrative and technical staff in February 1986. The $4.4 M structure features an open office floorplan and external sunscreens to conserve electricity and reduce airconditioning costs.

Extensions to The South West Queensland Electricity Board's Dalby headquarters were officially opened by the Minister for Mines and Energy, the Hon. Ivan J. Gibbs, M.L.A.

The Capricornia Electricity Board

Consumer numbers increased by 1 729, representing a 2.7 per cent growth over the year, reflecting more stable development of mining and related enterprises than over the previous seven years of operations.

Coal mining development was limited to the expansion of facilities at Moura, Oaky Creek and Blair Athol mines, while electricity sales overall increased by 7.87 per cent to 1 493 GWh. Commercial and residential energy sales increased by 4.0 per cent despite keen market competition.

Following reorganisation at the start of the year, more effective consumer service and better communications played an important role in maintaining electricity's energy market share in

Capricornia Electricity Board provided 66 kV supply to the Iwasaki Tourist Resort near Yeppoon.

Central Queensland during the year.

The year was the last of continuous generation at Longreach and Barcaldine power stations. Interconnection of the CEB western system to the QEC State grid was achieved at the end of June. Isolated generation facilities were upgraded at Jundah with the installation of two 145 kW site-rating generator sets and automatic control systems incorporating automatic synchronising and load-sharing facilities.

A new bulk supply 66 kV substation was constructed at Barcaldine in association with the QEC transmission line from Clermont to Barcaldine. Other major 66 kV substations were upgraded at Monto and Yeppoon. Substantial work also was carried out on similar substations at Canning Street, Rockhampton South and Glenmore bulk supply substation at Rockhampton. Major 66 kV line works were carried out at Yeppoon, Rockhampton South, Parkhust/ Wattlebank, Glenmore and Canning Street.

The Board provided 66 kV supply to the Iwasaki tourist resort at Farnborough, north of Yeppoon, where the Iwasaki Sangyo Company constructed its own 66/11 kV substation and reticulation to several supply points.

Rural development was accelerated with total expenditure of about $6 M involved in projects at Carnarvon Gorge, Kilcummin, Arcadia Valley, Willows, Diglum Creek/Degalgil, Wooroonah/Woorabinda, MacKenzie River, Jericho South, Stonehenge and Milparinka.

Tenders were called for peak-lopping load-control equipment to enable controlled water heating to be implemented, providing consumers with savings on water heating costs.

A new stores complex was completed at Glenmore to accommodate all stores functions previously situated in several locations in Rockhampton. The $1 M building incorporates 2 400 m² of floor area and houses office staff and amenities as well as the general storage facilities.

The Mackay Electricity Board

The high demand for underground reticulation to urban subdivisions was maintained with 756 lots supplied at a cost of more than $0.8 M.

There was a reduction in the number of requests for new subdivisions in the last quarter of the year. Rural living maintained its popularity with supply extended at a cost of over $0.5 M to more than 350 country estate lots varying in size from 0.5 hectares to 10 hectares.

Electricity sales of 711.9 GWh, an increase of 4.3 per cent, compared with increases of 15.8 per cent in 1983/84 and 13.6 per cent in 1982/83. High increases in the previous years had been influenced by commencement of operations at Riverside Coal Mine and the Dalrymple Bay coal loading facility. Sales to general consumers increased by 6.6 per cent and to coal mines by 1.7 per cent. The number of consumers increased by 3.3 per cent to a total of 36 312.

Work was finished on a $0.6 M Mackay district office at the Ness Street depot site in West Mackay; the building was officially opened by the Minister for Mines and Energy, the Honourable Ivan J. Gibbs, M.L.A., on 31 July 1985. Staff occupied the building in February which allowed the Mackay District Manager and his technical staff to be situated in the same building as their field staff. The new building also accommodates construction and maintenance supervisory staff, safety officer, transport officer, survey personnel and a staff training area.

Construction started on a new twin 12.5 MVA 33/11 kV substation at South Mackay to provide power to the developing industrial estate. The $1.3 M substation was due to be commissioned in November 1985.

Construction also started on a 40 km 33 kV hybrid SWER system to upgrade supply to the railway township of Coppabella. The town's population of 400 was expected to grow to 700 by 1990.The hybrid SWER system will take three-phase 33 kV power to Coppabella but allow all rural properties along the way to remain connected via their 19.1 kV SWER lines and transformers.

Design started for railway electrification, scheduled for completion in 1986/87, which requires establishment of five bulk supply substations in the Board's area of supply. Electrification was expected to contribute around 40 MW to annual system demand when fully operational with electricity usage of 132 GWh per year.

The operating fund budget had a cash surplus of $8 900 for the year with disbursements totalling $59.74 M. Receipts from electricity sales were $54.7 M. Expenditure on new capital works was $6.56 M, down $0.91 M on last year's expenditure of $7.47 M.

The North Queensland Electricity Board

The high levels of development experienced over the past three years

Hollow-spun reinforced concrete poles were used on the $4.4 M reinforcement programme for Townsville's fast-developing western area.

in the supply area continued during 1984/85 with consumer numbers increasing by 1 984 to 73 905 to maintain the consumer growth rate at 2.8 per cent.

The increasing demand for supply extensions to new residential subdivisions in Townsville was reflected by the district's 3.6 per cent rise in consumer numbers. In order to meet the demand, the Board had to divert resources from other planned reinforcement and maintenance projects.

During the year, two major supply reinforcement programmes, to cost an estimated $15 M, were started. In Townsville's rapidly-developing western suburbs, the construction of 17.5 km of 66 kV line, a 66 kV switching station and a 66/11 kV substation will upgrade supply security and maintain statutory voltage conditions.

Stage one of an $11 M reinforcement programme for mid-western consumers was started. It involved construction of 217 km of 66 kV line from Charters Towers to Richmond, the reconstruction from 33 kV to 66 kV of another 251 km of lines and a 66/33 kV substation at Richmond.

The development of Townsville's Breakwater Island Casino complex necessitated advancing the construction of a new 66/11 kV zone substation in South Townsville. To cost an estimated $4 M, the substation will be the largest yet constructed by the Board and will provide improved levels of supply security for consumers in North Ward, Magnetic Island, South Townsville and the central business area.

Energy purchases of 1 125.7 GWh represented an increase of 5.0 per cent, while receipts from sales of electricity, at $92.4 M, were $11.1 M over those for 1983/84 and indicative of the region's consistent growth rate and consequent demand for electricity. A maximum demand of 174.5 MW was recorded on the Board's interconnected system in July 1984.

The Far North Queensland Electricity Board

Demand for rural and urban extensions to new consumers and reticulation of urban and rural subdivisions remained at a high level during the year.

Construction of rural extensions under the Rural Electricity Subsidy Scheme continued, with a major extension of 265 km of 19.1 kV SWER line in the Einasleigh/Oak Park area bringing supply to 19 properties. A 27 km three-phase 22 kV line was erected to supply the water reticulation pumps at Glenore Weir for Normanton township and, from this line, 32 km of 19.1 kV SWER and 22 kV lines were erected to supply a group of 11 properties under the scheme's guarantee conditions. Work started on erecting a 53 km three-phase 22 kV line from the Cooktown line at Helenvale to Lakeland, now being supplied under licence by G W Pastoral.

Supply was provided for an agreed demand of 13.5 MW for Kidston Gold Mines Ltd from a new 132/6.6 kV bulk supply point at Kidston.

Installation of load management control equipment on the distribution system continued. Additional 22 kV injection stations were commissioned at Mareeba and Innisfail and installation started of stations at Atherton and Tully. Load control relays had been installed on 8 000 existing installations in the Cairns and Kamerunga areas by the end of the year and installation of relays in the Mareeba area continued.

Redevelopment of the 66/22 kV substation at Atherton was under way and stage two started for augmentation of the Cairns-Hartley Street Bulk Supply Substation. A new 720 kW generating set was installed at Thursday Island and the salt water cooling system to other generating sets replaced by air-cooled radiators.

District offices at Tully and Mareeba were relocated to the respective distribution depots. The Tully premises will be disposed of in a manner agreed to by the Land Administration Commission and the Mareeba property was acquired by Mareeba Shire Council.

The Board continued to provide engineering and other assistance to aboriginal communities to construct, operate, repair and maintain isolated electricity schemes at Aurukun, Bamaga, Doomadgee, Edward River, Kowanyama, Lockhart River and Mornington Island.

The number of consumers supplied by the Board increased by 5.3 per cent to a total 55 326 during the year. Electricity sales rose by 9.9 per cent to 583.4 GWh. Bulk electricity purchases were made from the State generating authorities (617.7 GWh) and A.G. Raptis (Karumba) Pty Ltd (3.0 GWh). Diesel generation at isolated systems totalled 11.5 GWh. The maximum demand on the Board's system reached 112.9 MW.

The Queensland Electricity Supply Industry Superannuation Board

The Queensland Electricity Supply Industry Employees' Superannuation Scheme, to provide superannuation to the industry's employees and their dependants, successfully completed its fifth year of operation.

Of particular significance to the scheme's operations were the benefit enhancements which took effect from 30 August 1984 and enactment of Commonwealth legislation covering the taxation of lump sum benefits and introduction of approved deposit funds.

One of the more-important improvements to benefits entailed a change to the method of calculation; the benefit now is based on the member's average annual salary for the two years immediately before retirement instead of three years as previously.

At 30 June, the assets of the Board had a book value of about $240 M representing an increase of 20 per cent over the book value the previous year. The corresponding market value at 30 June was more than $255 M.

Contributions to the scheme were $36.8 M consisting of $12.8 M from members and $24.0 M from employers.

The nature of the scheme is such that future benefits for members of the Defined Benefit Account are substantial contingent liabilities of an actuarial kind which are reviewed periodically.

An investigation as to the state and sufficiency of the scheme to meet emerging benefits last was made based on membership and asset data as at 30 June 1982. The Board was not aware of any circumstances that have arisen since the date of the last investigation which indicate other than actuarial soundness of the scheme. The next actuarial investigation was to be undertaken on 30 June 1985.

The Queensland Electricity Generating Board

In accordance with the provisions of the Electricity Act Amendment Act 1984, a final report on the activities of The Queensland Electricity Generating Board for the period 1 July to 31 December 1984 will be submitted to the Commission when audited accounts for that period are available.

Generating Plant (As at 30/6/85)

Coal-fired

	TURBO-GENERATOR				BOILER			
Station	Number of Sets	Maximum Continuous Rating (MW)	Manu-facturer	Year installed	Number	Maximum Continuous Rating (MW)	Manu-facturer	Year installed
Gladstone	6	280	Siemens	1976, 1977, 1978, 1979, 1981, 1982	6	280	Riley Dodds	1976, 1977, 1978, 1979, 1981, 1982
Swanbank B	4	125	Siemens	1970, 1971, 1972, 1973	4	125	Mitchell	1970, 1971, 1972, 1973
Swanbank A	6	68	Brown Boveri	1966(2), 1967, 1968(2), 1969	6	68	Mitchell	1966(2), 1967, 1968(2), 1969
Tarong	2 (ultimately 4)	350	Hitachi	1984, 1985	2 (ultimately 4)	350	Babcock-Hitachi	1984, 1985
Callide A	4	30	Parsons	1965, 1967(2), 1969	4	32	Riley Dodds	1965, 1967(2), 1969
Collinsville	1	60	Parsons	1974	1	63	International Combustion	1974
	4	30	A.E.I. (2)	1968(2)	4	33	John Thompson	1968(2), 1970, 1971
			Mitsubishi (2)	1970, 1971				
Tennyson	2	62	Brown Boveri	1962, 1964	4	33	Babcock & Wilcox	1962, 1963, 1964(2)
	4	31	Parsons	1955(2), 1958, 1959	8	18	Babcock & Wilcox	1955(2), 1956(2), 1958(2), 1960(2)
Bulimba	6	31	Parsons	1953, 1954, 1956, 1959, 1962, 1964	12	18	Babcock & Wilcox (10) Riley Dodds (2)	1953(2), 1954(2), 1956, 1957, 1959(2), 1962(2), 1964(2)

Gas Turbines

Station	Maximum Continuous Rating (MW)	Alternator Manufacturer	Turbine Manufacturer	Gas Generator Manufacturer & Type	Year Installed
Swanbank C	26	English Electric	English Electric	Rolls Royce Avon	1969
Middle Ridge	56	English Electric	English Electric	Rolls Royce Avon	1970
Mackay	34	Brush	Rolls Royce	Rolls Royce Olympus	1976 (Stage I — 17MW) 1977 (Stage II — 17 MW)
Gladstone	14	G.E.C.	G.E.C.	Rolls Royce Avon	1976
Rockhampton	25	English Electric	English Electric	Rolls Royce Avon	1967
Tarong	15	G.E.C.	G.E.C.	Rolls Royce Avon	1983

Hydro-electric

Station	Number of Sets	Maximum Continuous Rating (MW)	Alternator Manufacturer	Turbine Type	Turbine Manufacturer	Year Installed
Kareeya	4	18	English Electric	Pelton Wheel	English Electric	1957(2), 1959(2) 1963(2)
Barron Gorge	2	30	A.S.E.A.	Francis	Boving	1963(2)
Wivenhoe (Pumped storage)	2	312*	Mitsubishi	Francis	Toshiba	1984(2)

(In pumping mode, the 312.5 MVA Mitsubishi motor/generators each drives a 207m³/s Toshiba centrifugal pump).

*At maximum head.

First Annual Report 1985
Queensland Electricity Commission

This Report incorporates details of the activities of the former
State Electricity Commission of Queensland, 1 July — 31 December 1984.